The Emotional Intelligence of Resident Physicians

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ABSTRACT

Since academic literature indicates that emotional intelligence (EI) is tied to work performance, there is increasing interest in understanding physician EI. We studied the EI of resident physicians in surgery, pediatric, and pathology residency programs at three academic centers to describe the EI profiles of residents in different specialties and determine whether gender differences in resident physician EI profiles mirror those in the general population. 325 residents were electronically invited to complete the validated Trait Emotional Intelligence Questionnaire (TEIQue), a tool comprised of 153 items that cluster to 15 independent facets, 4 composite factors, and 1 global EI score. The overall response rate was 42.8% (n=139, 84 women). Global EI of all residents (mean=101.0, SD=8.0) was comparable to the general population sample and was not statistically different between specialties or genders. EI profiling demonstrated distinct strengths and opportunities for development between specialty groups with an effect of specialty on sociability factor (p=0.005) and five TEIQue facets including optimism, stress management, emotion management, assertiveness, and social awareness (p=0.008-0.043). Women scored higher than men in emotionality factor (p=0.044) and the TEIQue facets impulse control, empathy, relationships, and self-motivation (p=0.004-0.049). Men scored higher than women in sociability factor (p=0.034) and 2 facets including stress management and emotion management (p=0.008-0.023). Linear regression demonstrated that age had a statistically significant predictive relationship with Global EI, though the effect was small (*B*=0.033, p=0.014). These findings suggest that similar to the general population, male and female residents may benefit from specific training of different EI domains to enhance well-rounded development. EI profiling may also inform future educational programming decisions for each specialty. Future research should focus on the functional relationship between educational interventions that promote targeted EI development and enhanced clinical performance.

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GLOSSARY OF ABBREVIATIONS

ACGME – Accreditation Council for Graduate Medical Education

ACT – American College Test

ANOVA – Analysis of Variance

BIDMC – Beth Israel Deaconess Medical Center

BS/MD – Bachelor of Science/Medical Doctor

BWH – Brigham and Women's Hospital

EI – Emotional Intelligence

ESCI – Emotional and Social Competence Inventory

EQ-i – Bar-on Emotional Quotient Inventory

GPA – Grade Point Average

IQ – Intelligence Quotient

MD – Medical Doctor

MGH – Massachusetts General Hospital

MSCEIT – Mayer-Salovey-Caruso Emotional Intellience Test

SD—Standard Deviation

TEIQue – Trait Emotional Intelligence Questionnaire

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INTRODUCTION

Emotional intelligence – background

Definition and conceptual models

One of the most commonly cited definitions of EI is the "ability to monitor one's own and others' emotions, to discriminate among them, and to use this information to guide one's thinking and actions" (J. Mayer & Salovey, 1997). More succinctly, EI describes how an individual manages his/her own emotions and the emotions of others. Salovey and Mayer introduced their theory of emotional intelligence in 1990, and the topic has since gained both academic and popular interest, most notably through the writings of Harvard Business School professor Dan Goleman who wrote in his 1998 essay "What Makes a Leader?" that "emotional intelligence is the sine qua non of leadership" (Goleman, 1995, 1998a, 1998b, 2013; P Salovey & Mayer, 1990).

Though the idea of EI was introduced over 20 years ago, there continues to be academic debate regarding the nature of EI. Several researchers embrace the conceptualization of EI as an ability, either as a social intelligence or a type of cognitive skill (Reuven Bar-On & Parker, 2000; Goleman, 1998b; J. Mayer & Salovey, 1997; J. D. Mayer, Salovey, Caruso, & Sitarenios, 2003; Roberts, Zeidner, & Matthews, 2001). Others have promoted a trait conceptualization of EI in which an individual's EI reflects disposition and personal characteristics (K. V. Petrides & Furnham, 2001; K. V. Petrides, Pita, & Kokkinaki, 2007). The particular stance towards EI influences the approach to EI measurement and assessment (Arora et al., 2010; Lewis, Rees, Hudson, & Bleakley, 2005). Within an ability construction of EI, self-report is inadequate to capture how an individual performs with regard to managing his emotions and the emotions of others. Furthermore, an ability model of EI presents the challenge of determining objective

standards against which ability should be measured. For trait EI, pure self-report can be an effective way to determine an individual's tendencies and characteristics (K. V. Petrides, 2012; K. V. Petrides & Furnham, 2001; K. V. Petrides et al., 2007). Still, self-report does not capture how that individual performs in reality. For example, a person who has low trait assertiveness may, through self-awareness and practice, succeed in negotiations even though it may be more effortful for him or her compared to a colleague who has high trait assertiveness. Importantly, both the trait and ability frameworks of EI reject the hypothesis that EI is fixed and immutable. Rather, proponents of both models assert that EI can be taught, learned and developed, and that it responds to life experiences and the conscious self-development efforts of an individual (Goleman, 1998a; K. V. Petrides, 2012; Peter Salovey & Sluyter, 1997).

Emotional intelligence in the workplace

Much of the increasing interest in emotional intelligence is driven by research that demonstrates a positive relationship between EI and work performance characteristics, primarily in the corporate setting. In a study of executives in a multi-national food and beverage company, McClelland found that those hired on the basis of emotional competencies had a 6% two-year turnover rate compared to the 50% turnover rate experienced by those hired through traditional methods (McClelland, 1998). Furthermore, executives with strong EI exceeded annual earnings goals by 20% whereas their colleagues with lower EI underperformed relative to targets. There were similar findings in the European and Asian divisions, suggesting that the importance of EI is not limited to particular cultural contexts. Other researchers demonstrated that the emotional competency of stress management was positively correlated with job performance in retail store managers as measured by net profits, sales per square foot, sales per employee, and sales per dollar inventory investment (Lusch & Serpkenci, 1990). Goleman claims that emotional

intelligence is twice as important as technical skill and traditional intelligence quotient (IQ) as an ingredient to excellent job performance across all employment levels and business sectors (Goleman, 1998a). He asserts that the importance of EI increases with position, with up to 90% of the difference in performance of senior leaders attributed to differences in EI factors. Unfortunately, many of the details of corporate research projects such as Goleman's are proprietary, since for-profit enterprises attempt to use this research to establish a competitive market edge. A meta-analysis of 57 published research articles including over 12,000 individuals does, however, support the claim that emotional intelligence is a valid predictor of job performance (Van Rooy & Viswesvaran, 2004). Emotional intelligence may also influence group functioning, with high EI teams demonstrating a high level of performance throughout a task, in contrast to low EI teams which start out at lower levels of performance and eventually catch up to the performance level of the high EI teams (Jordan, Ashkanasy, Härtel, & Hooper, 2002). In short, the business community has embraced EI and the view that by placing a high value on the skill of emotion management, a company can improve performance and consequently profits, optimize employee hiring and retention, and create a more satisfying customer experience (Cherniss, 1999; Freedman, 2010).

Emotional intelligence in medicine

Rationale for increased interest in physician EI

Perceiving and managing emotions is fundamental to medicine: physicians must navigate their own emotions as well as the emotions of patients and other team members, often in high-tension and charged situations, in order to succeed as effective practitioners. The Accreditation Council for Graduate Medical Education (ACGME) has defined six core competencies—Patient Care, Professionalism, Systems-based Practice, Interpersonal and Communication Skills,

Medical Knowledge, and Practice-based Learning and Improvement—that trainees are expected to attain by the conclusion of residency (Stewart, 2001). Intuitively, emotional intelligence is applicable to interpersonal skills and communication. However, if one considers all of the scenarios in medicine that require careful management of emotion, it becomes apparent that EI may underpin other ACGME competencies as well. A literature review of emotional intelligence in healthcare settings demonstrated the broad relevance of EI to medicine, including domains related to the competencies of Interpersonal Skills and Communication, Patient Care, Professionalism, Medical Knowledge and Practice-based Learning and Improvement (Arora et al., 2010). As such, there has been an increasing call for incorporating the development of emotional intelligence into medical training (Arora et al., 2010; Grewal & Davidson, 2008; Lewis et al., 2005; Pilkington, Hart, & Bundy, 2012; Taylor, Farver, & Stoller, 2011; Webb, Young, & Baumer, 2010).

Emotional intelligence and medical students

Multiple studies have been published describing the EI profiles of medical students and the association of EI with medical student characteristics such as admissions measures, empathy, academic performance, specialty choice, and residency rank list placement (Arora et al., 2011; E. J. Austin, Evans, Goldwater, & Potter, 2005; E. J. Austin, Evans, Magnus, & O'Hanlon, 2007; Brannick et al., 2009; Carr, 2009; Carrothers, Gregory, & Gallagher, 2000; Lin, Kannappan, & Lau, 2013; Stratton, Saunders, & Elam, 2008; Todres, Tsimtsiou, Stephenson, & Jones, 2010). Using a 41-item trait emotional intelligence scale, Austin and colleagues investigated whether EI scores in United Kingdom first-year medical students were related to academic performance, as measured by exam performance in a course entitled "Health and Society," or medical student empathy, as measured by the Jefferson Physician Empathy Scale (E. J. Austin et al., 2005;

Elizabeth J. Austin, Saklofske, Huang, & McKenney, 2004; Mohammadreza Hojat et al., 2001). They found a highly statistically significant correlation between medical student EI score and empathy score ($p<.001$), and medical student EI positively correlated with exam score in the first academic term but not later in the year. Female medical students scored statistically significantly higher than male medical students on overall EI, each EI subscale, and empathy. Expanding the research to students in Year 2 and 5 of medical school, the investigators demonstrated again that women scored higher than men in empathy, overall EI, and multiple EI subscales (E. J. Austin et al., 2007). EI was not found to be significantly associated with year-end marks, though it was found that students with higher EI received higher peer ratings for problem-based learning groups than students with lower EI. Furthermore, there was no main effect of medical school year on EI or empathy score. Repeated measures ANOVA indicated that in men, empathy scores significantly increased between Year 1 and Year 2, while empathy scores declined near-significantly for women across the same time period ($p=.065$), suggesting that developmental changes in empathy during training may be different between genders. Researchers in the United States have also examined how the EI of medical students changes over time (Stratton et al., 2008). Employing a trait-based inventory, Stratton and colleagues administered an EI questionnaire to 64 medical students during their orientation to medical school in Year 1 and after completing the core clinical curriculum at the end of Year 3. There was a statistically significant decline in three EI subscales (attention to feelings, mood repair, and empathic concern) and a statistically significant increase in personal distress, though the magnitude of change for all of these measures was modest. Gender differences were reported in this study, with women scoring statistically higher than men in empathic concern at both time points and higher in attention to feelings and personal distress at Year 1 only. In summary, these studies

demonstrated that women scored higher on men on EI assessments and that EI may change during medical school.

The role of EI in medical student selection has also been examined, both at the medical school and residency levels. In one study, 659 applicants to a Canadian medical school completed the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT), a 141-item self-assessment adhering to the ability construct of EI (Leddy, Moineau, Puddester, Wood, & Humphrey-Murto, 2011). Traditional measures of medical school admission were also recorded, including weighted GPA, autobiographical details such as volunteering and extracurricular experiences, and interview scores. There was no correlation between applicant EI score and any traditional admission measure. Furthermore, there was no difference in the EI scores of applicants who were offered admission to the medical school and those who were not. Female applicants demonstrated higher overall EI scores than male applicants. The authors concluded that EI measured something distinct from what is traditionally taken into account during the medical school admissions process. An earlier study also examined the role of EI in medical school admissions at a six-year integrated BS/MD program (Carrothers et al., 2000). Using a self-developed EI tool in which applicants were rated by an admissions interviewer on a seven-point scale of word pairs (example: insecure/secure), the researchers examined the association of EI with gender, admission outcome, and traditional admissions measures including high school grade point average (GPA), American College Test (ACT) score, and interview score. There was a low correlation between EI scores and GPA and ACT, and a high correlation with interview scores (Pearson coefficient =.761), though p-values were not reported. Female applicants scored higher in EI than male applicants, and applicants who matriculated to the 6-year program with an emphasis on social sciences and humanities had higher EI scores than those joining two other programs with fewer required humanities courses, though again p-values

were not reported. Still, an outstanding question remains with regard to the utility of EI in medical school admissions.

There have also been studies examining medical students at the point of entering into a residency training program. A recent study examined EI of applicants to a general surgery residency program using the Trait Emotional Intelligence Questionnaire (TEIQue), a 153-item self-assessment of trait EI which clusters to 15 independent facets and 4 composite factors (Lin et al., 2013). Investigators examined whether EI was correlated with traditional measures of applicant quality such as USMLE scores, clerkship grades, number of publications, honors society status, faculty evaluation of the interview, and faculty evaluation of applicant EI using the Trait Emotional Intelligence Questionnaire 360˚ Short Form (360˚ SF). A total of 53 applicants participated in the study. Applicants scored statistically significantly higher in overall EI when compared to the general population, and there was no difference between men and women applicants. Age was the only demographic predictor of EI, with EI increasing modestly with age. There was no correlation between EI scores and any academic parameter except USMLE score, for which there was a slight negative correlation. There was no correlation between EI as measured by the TEIQue or EI as evaluated by the faculty 360˚ SF, and EI did not correlate with faculty evaluation of the applicant's interview. Despite the lack of correlation between measured EI and traditional admissions parameters, there was a modest correlation between EI and rank status, with unranked candidates scoring significantly lower in EI than ranked candidates. Given the mixed findings, the authors concluded that it was too early to include EI as a parameter for selecting general surgery residents.

Finally, Borgest *et al.* retrospectively analyzed data from three studies to compare the EI of students entering different specialties in an attempt to understand whether medical students

with different EI profiles self-select to different career paths (Borges, Stratton, Wagner, & Elam, 2009). They retrieved match data for 292 students and classified each student's choice as primary care (family medicine, internal medicine, pediatrics) vs. non-primary care (all others) and technical/procedural hospital-based specialties (neurology, obstetrics and gynecology, ophthalmology, all surgical fields) vs. non-technical (anesthesiology, radiology, pathology, emergency medicine). In short, there were no differences in measured EI between students who entered primary care fields and those who did not, or between those students entering technical/procedural hospital-based specialties and those entering non-technical/non-procedural hospital-based specialties. One limitation of the study is that the different studies included in the meta-analysis employed a variety of different EI measures, including both trait and ability based tools. Again, the utility of EI in a medical training selection process was not established, only that it did not appear to be predictive of a selection outcome.

Emotional intelligence in graduate medical education

Despite the interest in EI and its potential role in multiple ACGME core competencies, only a handful of studies have attempted to characterize the EI profiles of resident physicians. Jensen et al. described the EI of 74 surgical residents at a university program using the BarOn Emotional Quotient Inventory (EQ-i), a self-report tool rooted in the ability conceptualization of EI in which 133-tems cluster to 5 composite scores and 15 content subscores, as summarized in Table 1 (Reuven Bar-On, 2004; Jensen et al., 2008). While there was a wide range of individual scores, mean group scores were higher than the national average overall and for each of the 5 composite and 15 content scales. Residents scored highest in stress tolerance and lowest in social responsibility, a component of the composite interpersonal score. EI did not correlate with age or training level. This descriptive study did not comment on gender differences within the

resident group, nor did it attempt to establish the predictive validity of EI on resident performance.

Other studies have attempted to link resident physician EI with clinical performance. One study attempted to correlate anesthesiology resident EI with faculty evaluations, again using the EQ-i in a university setting (Talarico, Metro, Patel, Carney, & Wetmore, 2008). The faculty evaluation consisted of American Board of Anesthesiology attributes as well as the six ACGME core competencies. Of the 5 composite and 15 content scales, only assertiveness had a statistically significant relationship with faculty evaluation, demonstrating a negative correlation with American Board of Anesthesiology attribute scores. There was no statistically significant relationship between any of the EI scores to the six ACGME core competencies, though one major limitation of this study was its low power, as it included only 26 residents. Descriptive statistics of the residents were not published, nor was there any investigation into the effect of gender or PGY on measured EI. A second study by the same researchers recruited residents from anesthesiology residencies at five academic institutions (Talarico et al., 2013). Eighty-six of 339 invited residents completed the study in which the EQ-i was again used to determine if a correlation existed between resident EI and clinical performance as measured by faculty evaluation of the six ACGME core competencies. In contrast to the earlier paper, assertiveness was positively correlated with all of the six ACGME competencies aside from Professionalism, and several other of the EQ-i scores were statistically significantly correlated with all six of the ACGME core competencies with a modest effect size. These scores included: total EQ-i score, intrapersonal composite score, self-regard, self-actualization, and stress tolerance. There were no statistically significant gender differences in EQ-i total score, composite scale, or content score aside from empathy, though the authors did not indicate which gender scored higher. Again,

descriptive statistics of the residents as a group were not published, but these findings suggest that given a large enough number of participating resident physicians, EI may have predictive validity for resident physician performance.

Two other studies have examined the predictive validity of EI in resident physician clinical performance using measures other than faculty evaluation of ACGME core competencies. In one study, investigators attempted to demonstrate a link between resident physician EI and performance as indicated by whether a resident was selected to serve as chief administrative resident (Kilpatrick et al., 2012). Forty-six residents across 7 different specialty groups completed the EQ-i and a demographics form. There was no statistically significant difference between the scores of residents selected to be administrative chiefs and those that were not selected. Additionally, linear regression analyses failed to demonstrate a statistically significant association between EI scores and gender, age, or training level. Finally, one study of 28 resident physicians in a university-based internal medicine department demonstrated both an increase in resident physician EI over time and a positive relationship between resident EI and clinical performance (Satterfield, Swenson, & Rabow, 2009). Instead of using the EQ-i, the researchers employed the Emotional Intelligence Survey (EIS), a 33-item self-report tool that subscribes to the ability model of emotional intelligence (Schutte et al., 1998). The residents completed the EIS at the end and the beginning of an academic year, and scores increased significantly between the two time points. The EI score at the end of the academic year, but not the beginning of the year, demonstrated a statistically significant positive correlation with faculty scores in interviewing and overall performance. There was also a statistically significant negative correlation between resident EI score at the end of the year with burnout as measured by the Tedium Index, a 21-iem self-report questionnaire designed to assess mental, physical, and emotional exhaustion (Pines, 1981). Overall, EI scores resembled the general population and

there were no gender differences found. In summary, studies of resident physicians have been limited by small numbers of participants, emphasized an ability construct of EI, and have demonstrated mixed findings with regard to EI as a valid performance predictor.

At least one study has attempted to intentionally develop resident physician EI through an educational intervention (Webb et al., 2010). In this study, investigators aimed to test the hypothesis that EI scores of family medicine residents would increase after receiving EI coaching from a trained and certified EI coach. They were unable to draw conclusions about this hypothesis because out of 21 residents, zero residents completed the entire coaching intervention, for which residents received no protected time. Nine of 21 residents participated in some of the coaching sessions, most attending the first session only. Interestingly, the study employed a commercial 360 rating system, the Emotional and Social Competence Inventory (ESCI, available from www.haygroup.com), which enabled the investigators to compare self versus other ratings. They reported that the self-ratings of residents were statistically significantly lower on all nine ESCI competencies compared to the ratings of others, suggesting that residents may discount their own EI. Additionally, both the self and other ratings were statistically significantly lower for teamwork at the end of the 10-month intervention period compared to the beginning. There were no reported gender differences for any of the ESCI competencies. Perhaps the most important conclusion from this study is that in order for an EI intervention targeted to resident physicians to be feasible, it must be delivered in a way that is either available on-demand such that a resident can access it a convenient time, or residents must be protected from clinical and other duties that would otherwise impede participation in such an intervention.

Emotional intelligence and physician performance

Outside of the context of educational settings, researchers have investigated whether EI can be a valid predictor of physician performance in the same way that it has been shown to positively predict performance in a business setting. Using the EQ-i and a patient satisfaction survey administered to 232 patients, Wagner *et al.* determined that the only statistically significant difference between physicians with a 100% satisfaction rating and those with a <100% satisfaction rating was in the happiness subscale (Wagner, Moseley, Grant, Gore, & Owens, 2002). In this study, women physicians scored statistically significantly higher than men in stress management.

Weng and colleagues have published several studies of the effects of EI on Taiwanese physician work performance outcomes including the patient-doctor relationship, patient satisfaction, and doctor burnout (Weng, Chen, Chen, Lu, & Hung, 2008; Weng, Chen, et al., 2011; Weng, Hung, et al., 2011; Weng, Steed, et al., 2011). This research employed the Wong and Law Emotional Intelligence Scale (WLEIS), a 16-item tool based on an ability conceptualization of EI. In one study, the investigators computed physician EI based on both self-rating and nursing director ratings (Weng et al., 2008). Data regarding the patient doctor relationship was collected both from physicians and nursing directors using the 9-item Patient-Doctor-Relationship Questionnaire-9 (Van der Feltz-Cornelis, Van Oppen, Van Marwijk, De Beurs, & Van Dyck, 2004). In addition, patients were queried regarding how much they trusted their physician. In total, 39 physicians from various specialties and 994 patients participated in the study. Researchers reported that EI increased with physician age and years of experience, and that there was a statistically significant correlation between patient-rated trust and physician EI as rated by the nursing directors but not physician self-rating. There was also a statistically

significant positive correlation between the nursing director ratings of physician EI and the nursing director ratings of patient-doctor relationship. In a different study, the same group of researchers examined the relationship between physician self-rated EI and physician burnout and job satisfaction (Weng, Hung, et al., 2011). Burnout was measured by the Maslach Burnout Inventory (MBI), which address emotional exhaustion, depersonalization, and personal accomplishment. A total of 110 internists participated, as did 2872 patients who answered a two-item survey on their satisfaction with their physician. Higher physician EI was negatively correlated with all sub-dimensions of work burnout and positively correlated with job satisfaction; there was no statistically significant correlation between physician EI and patient satisfaction.

Weng and colleagues have also demonstrated that the relationship between physician EI and patient satisfaction persists in a surgical setting. In a study of 50 surgeons and 549 patients, there was a statistically significant positive correlation between surgeon EI and the pre-surgical patient-doctor relationship, again as measured by the WLEIS and PDRQ-9 (Weng, Steed, et al., 2011). Post-operatively, however, physician EI did not have a significant correlation with the patient-doctor relationship. Finally, in a study which combined both internists and surgeons, it was determined that physician EI had a statistically significant positive correlation with patient satisfaction (Weng, Chen, et al., 2011). A total of 110 internists, 101 surgeons, and 5344 patients participated in the study, in which nursing directors completed the WLEIS on each physician as the measure of physician EI. Self-assessment was not used as a measure of physician EI. An additional result from this study, one of the few specialty EI comparisons in the literature, was a finding of no difference in either EI or the patient-doctor relationship between internists and surgeons. However, the patients of the internists did report a statistically higher level of trust in their physician than the patients of the surgeons. To summarize, a handful

of studies have used ability-based measures of EI to suggest that, as in the corporate world, higher physician EI may be associated with superior work outcomes.

Current study rationale and hypotheses

Based on findings in the business literature indicating that EI may be an ingredient to professional success, there is increasing interest in developing physician EI as a way to improve work performance. Few studies, however, have described resident EI profiles at all, and even fewer have employed a purely trait-dependent EI measurement tool. Given that EI is thought to underpin a variety of ACGME core competencies, understanding the EI profiles of residents may allow for a better understanding of which ACGME core competencies are adequately developed and which are in need of additional, targeted intervention. Residency directors may use the variability of residents' scores to better understand which domains require individualized attention and which competencies would benefit from group-based development. Additionally, there are no studies that compared the EI of resident physicians of different specialties. If different groups of residents displayed different EI profiles, future institution-level education programming could be focused to areas most in need of further development for a given residency program.

We conducted a study of the trait emotional intelligence of general surgery, pediatric, and pathology resident physicians at the Massachusetts General Hospital (MGH) and general surgery residents at Beth Isreal Deaconess Medical Center (BIDMC) and the Brigham and Womens' Hospital (BWH). In addition to describing the emotional intelligence profiles of these residents, this study aimed to test the following three hypotheses:

1) Pediatrics residents demonstrate higher global EI scores than surgery residents
2) Women residents demonstrate higher global EI scores than men residents

3) Global EI increases with increasing post-graduate year of training

The rationale for each hypothesis is as follows:

Pediatrics residents demonstrate higher global EI scores than surgery residents

There have been few studies that compare the EI scores of physicians across specialties, and those studies have not found differences between physicians or medical students who pursue different career paths within medicine (Borges et al., 2009; Weng, Chen, et al., 2011). Neither of these studies looked specifically at pediatrics. We hypothesized that pediatrics residents would have higher global trait EI than surgery residents because pediatrics residency involves perceiving and managing the emotions both of children and their families, which we believed would either attract medical students with higher global EI or lead to the development of high levels of global EI.

Women residents demonstrate higher global EI scores than men residents

While gender differences in EI of medical professionals have not consistently been reported, several authors have reported that women score higher than men on global EI or EI subscales (E. J. Austin et al., 2005; E. J. Austin et al., 2007; Carrothers et al., 2000; Wagner et al., 2002). A large general population sample also demonstrates that women demonstrate significantly higher global EI than men (K. Petrides & Furnham, 2006). As such, we predicted that female resident physicians would score higher on the EI assessment than male resident physicians.

Global EI increases with increasing post-graduate year of training

If EI underpins the ACGME competencies and residents become more competent throughout training, one might expect that EI increases across training as well. At least one

study has demonstrated that resident EI increases over time, though this finding has not been replicated in all studies of resident physicians or medical students (Jensen et al., 2008; Satterfield et al., 2009; Stratton et al., 2008). Another motivating factor behind this hypothesis is the observation that within groups of attending physicians, EI has been documented to increase with experience (Weng et al., 2008). Consequently, we predicted that EI would increase with training level of the residents.

METHODS

Participants & Recruitment

Resident physicians in the MGH Pathology, MGH Pediatrics, MGH Medicine-Pediatrics, MGH Surgery, BWH Surgery, and BIDMC Surgery residency programs were eligible to participate in the study. This was a convenience sample based on the agreement of the program directors of these residency programs to have their residents participate in the study. There were no exclusion criteria. Residents were electronically invited to participate in the study (Appendix 1) with up to 3 reminder invitations sent only to non-responders. We informed the residents that participation in the study was voluntary and that no individual with a supervisory role over the residents would have access to the identifiable data. As compensation for the time required to participate in the study, residents were offered professional, personalized emotional intelligence reports valued at approximately $165. To protect participant privacy, a key linking resident identifiers to survey responses was maintained only by an administrator with no supervisory role over any residents.

Study procedures (Figure 1)

Potential study participants were invited to the study in August 2013 and allowed up to 8 weeks to complete all study materials from the date of study invitation. Each resident was provided a unique URL to complete an electronic informed consent item (Appendix 2) and brief demographics survey (Appendix 3) which included participant age, gender, and highest completed clinical post-graduate year (training level). Electronic consent and demographics data were collected using REDCap electronic data capture tool hosted at Partners Healthcare (Harris et al., 2009).

After a resident physician completed the electronic consent and demographics survey, he or she was provided with a personalized link to the main study tool, the Trait Emotional Intelligence Questionnaire (Appendix 4). Again, the resident was reminded up to three times to complete the study tool. We chose to administer the emotional intelligence assessment via a commercial platform (www.thomasus.com) because of its user-friendly interface and the ability to provide study participants with high-quality emotional intelligence reports. No identifiable information was collected on the commercial website. Residents who completed the electronic consent and demographics form were also provided with the opportunity to complete a work behavior assessment and receive a corresponding Personal Profile Analysis. The results of the Personal Profile Analysis are not included in this thesis.

Data collection was closed in October 2013. Residents who completed the study received their personalized emotional intelligence reports in November 2013.

Trait Emotional Intelligence Questionnaire (TEIQue)

We assessed emotional intelligence using the Trait Emotional Intelligence Questionnaire version 1.50 (TEIQue, available from www.psychometriclab.com), a psychometrically validated emotional intelligence questionnaire which takes approximately 15-25 minutes to complete. The TEIQue is a 153-item self-assessment tool for EI in which each item is answered on a seven-point Likert scale depending on how strongly the examinee agrees or disagrees with a particular statement (1=completely disagree, 7=completely agree). These 153 items yield scores for 15 emotional intelligence facets, which then cluster to four broader emotional intelligence factors (Table 2). The 153 items in total also generate a single, global emotional intelligence score. The TEIQue has been used across a variety of cultures and languages with high reliability: Cronbach's alpha for the overall EI score =.92 with typical Cronbach's alphas >0.80 and >.70 for

TEIQue factors and facets respectively (Freudenthaler, Neubauer, Gabler, Scherl, & Rindermann, 2008; Mikolajczak, Luminet, Leroy, & Roy, 2007; K. V. Petrides, 2012). Aside from the TEIQue Empathy facet, all TEIQue factors, facets, and the global score demonstrate 12-month test-retest reliability beyond the p=.01 level with an overall stability coefficient of .78 (K. V. Petrides, 2012).

TEIQue Global, Factor, and Facet scores for each of the participating residents were calculated on a 1-7 scale by Thomas International per the TEIQue scoring key held by Dr. Petrides's group at London Psychometric Laboratory, University College London. To create group emotional intelligence profiles, these scores were normalized to Thomas International's large general population sample comprised of 1874 individuals with gender, age, and educational characteristics representative of the general working population. Standardized TEIQue Global EI, Factor, and Facet scores for the norm population have a mean=100 with standard deviation (SD) =15. Given these norm population parameters, any particular group TEIQue factor and facet scores >103 or <97 were deemed areas of group relative high and low development respectively per the Thomas International corporate development parameters.

Statistical analyses

Subsequent analyses on TEIQue Global, Factor, and Facet raw scores were completed using SPSS version 22 (SPSS Inc., Chicago, Illinois). Comparisons between groups were conducted using two-tailed Student's t-test or one-way Analysis of Variance (ANOVA). When appropriate, Tukey post-hoc pairwise comparisons were conducted for significance at the p=.05 level. Correlation analyses were conducted by calculating the Pearson product-moment coefficient. Stepwise linear regression analysis was conducted to determine the predictive strength of demographic variables age, gender, specialty, and number of completed post-graduate

years on resident physician Global EI. "Calibrated PGY" was calculated in order to standardize training length across specialties. This variable was calculated as 5*(Number of completed years reported)/(Number of years typical training for specialty), resulting in a range from 1 to 6.5 even though the longest training period for any specialty included in the study was 5 years (general surgery). Some residents may have switched specialties, resulting in a greater than typical number of post-graduate years. Other residents who participated in the study were taking an additional Chief year. Of note, there were 8 participating resident physicians who were in dual internal medicine and pediatric residency programs (med-peds) so pediatrics and med-peds residents were combined into a single specialty group. Gender analyses were conducted within the group of surgery residents because it was the largest group with an equal representation of men and women. Gender analyses were not conducted for pathology or pediatrics/med-peds due to small group sizes and uneven gender distributions.

Ethics board approval

All aspects of this study—including experimental design, recruiting methods, study tools, and data collection techniques—were approved by the Partners Human Research Committee Protocol number 2012P002001.

RESULTS

Participants

Of the 325 resident physicians who were invited to participate in the study, 139 (42.8%) completed all study materials, though the response rate varied by residency program (Table 3). MGH Pathology had the highest response rate (60.0%), and BIDMC Surgery had the lowest response rate (29.3%). The mean age of study participants was 30.1 years. Overall, 60.4% of respondents were women, though the proportion of men vs. women shifted depending on the residency program. One resident was excluded from age-based analyses due to a reported age of 100 years.

Emotional intelligence group profiles

As a group, all participating resident physicians (n=139) demonstrated a mean standardized Global EI score of 101.0 (SD=8.1, Table 4). Compared to the general working population sample, resident physicians exhibited strong EI scores in five TEIQue facets: self-esteem (mean=103.0, SD=12.2), impulse control (mean=103.0, SD=14.1), empathy (mean=104.8, SD=13.6), emotion management (mean=105.6, SD=10.8), and self-motivation (mean=104.7, SD=13.1). TEIQue facets with low EI scores relative to the norm samples included social awareness (mean=96.7, SD=13.9) and adaptability (mean=95.9, SD=11.7). The full group profile is detailed in Table 4.

The mean Global EI score of pathology residents (n=21) was 99.1 (SD=7.9). Group strengths relative to the norm population included four TEIQue facets: self-esteem (mean=103.3, SD=12.1), impulse control (mean=107.6, SD=10.9), relationships (mean=103.4, SD=11.6), and empathy (mean=105.8, SD=13.6). Pathology residents scored relatively low in sociability factor (mean=93.6, SD=13.2) and four TEIQue facets: optimism (mean=93.7, SD=13.4), assertiveness

(mean=93.2, SD=18.5), social awareness (mean=90.5, SD=12.9), and adaptability (mean=92.2, SD=11.4). The group profile for pathology residents in this study is displayed in Table 5.

Surgery residents (n=85) demonstrated a Global EI score of 101.7 (SD=8.3). They scored relatively high in self-control factor (mean=103.7, SD=10.2) and six TEIQue facets: self-esteem (mean=103.7, SD=12.4), emotion regulation (mean=104.1, SD=12.8), stress management (mean=104.6, SD=12.8), empathy (mean=103.4, SD=13.9), emotion management (mean=107.8, SD=9.8), and self-motivation (mean=105.3, SD=12.6). The TEIQue facet with the lowest score among surgery residents was adaptability (mean=97.3, SD=11.8). The full EI profile of surgery residents who participated in the study is detailed in Table 6.

The mean Global EI score of pediatrics and med-peds residents (n=33) was 100.3 (SD=7.6). Pediatrics and med-peds residents scored highly in emotionality factor (mean=10.3.7, SD=11.6) and five TEIQue facets: happiness (mean=105.1, SD=11.0), optimism (mean=103.5, SD=12.7), empathy (mean=107.8, SD=12.8), relationships (mean=106.1, SD=13.0), and self-motivation (104.2, SD=14.5). Low scores relative the general population sample were in assertiveness (mean=93.7, SD=13.7), social awareness (mean=95.4, SD=12.2), and adaptability (mean=94.7, SD=11.5). Table 7 describes the full emotional intelligence profile of participating pediatrics and med-peds resident physicians.

Across all specialties, men (n=55) exhibited a Global EI score of 100.8 (SD=8.0, Table 8). Women (n=84) across all specialties displayed a Global EI score of 101.1 (SD=8.2). Both men and women scored highly relative to the general population in emotion management (Men: mean=108.2, SD=9.3; Women: mean=103.9, SD=11.5) and low in adaptability (Men: mean=96.5, SD=11.4; Women: mean=95.6, SD=12.0). Men also scored highly in self-esteem (mean=104.2, SD=12.3), emotion regulation (103.2, SD=13.2), and stress management

(mean=105.8, SD=10.6). Women scored highly relative to the norm sample in emotionality factor (mean=103.1, SD=12.2), happiness (mean=103.6, SD=12.9), impulse control (105.9, SD=12.1), empathy (mean=106.6, SD=12.7), emotion perception (mean=103.3, SD=15.5), relationships (mean=105.1, SD=12.0), and self-motivation (mean=106.7, SD=12.6). Women scored relatively low in assertiveness (mean=95.8, SD=14.6) and social awareness (mean=95.5, SD=13.7).

Within the group of participating surgery resident physicians only, men (n=39) and women (n=46) demonstrated Global EI scores of 101.5 (SD=7.7, Table 9) and 101.9 (SD=8.8) respectively. Relative to the norm sample, both men and women in surgery residency scored highly in self-control factor (Men: mean=103.8, SD=10.2; Women: mean=103.6, SD=10.3), emotion regulation (Men: mean=104.9, SD=103.5; Women: mean=103.5, SD=12.8), and emotion management (Men: mean=108.7, SD=9.7; Women: mean=107.0, SD=10.0). Additionally, men scored relatively high in optimism (mean=103.0, SD=12.1), self-esteem (mean=104.9, SD=12.6), and stress management (mean=108.2, SD=9.9). Women scored relatively high in impulse control (mean=106.5, SD=12.9), empathy (mean=105.8, SD=12.7), emotion perception (mean=105.1, SD=16.5), and self-motivation (mean=107.9, SD=12.2) with a low score in adaptability (mean=96.8, SD=12.5).

Group comparisons

A one-way ANOVA was used to test for main effect of specialty on emotional intelligence raw scores (Table 10). Scores differed significantly across the three specialties—pediatrics & med-peds, pathology, and surgery—for sociability factor ($F(2,136)=5.51$, $p=0.005$) and five TEIQue facets including optimism ($F(2,136)=3.93$, $p=0.022$), stress management

($F(2,136)=3.23$, p=0.043), emotion management ($F(2,136)=4.95$, p=0.008), assertiveness ($F(2,136)=3.56$, p=0.031), and social awareness ($F(2,136)=3.24$, p=0.042).

Tukey post-hoc comparison of the three specialty groups indicate that in sociability factor score, surgery residents (mean=5.18, 95% CI [5.04, 5.31]) scored higher than pathology residents (mean=4.72, 95% CI [4.35, 5.09], p=0.015). Surgery residents also scored higher in social awareness (mean=5.15, 95% CI [4.96, 5.34]) than pathology residents (mean=4.64, 95% CI [4.29, 5.00], p=0.039). Pediatrics residents (mean=5.64, 95% CI [5.36, 5.93]) scored higher than pathology residents (mean=5.02, 95% CI [4.63, 5.41]) in optimism (p=0.025), as did surgery residents (mean=5.54, 95% CI [5.35, 5.72], p=0.035). Surgery residents (mean=5.30, 95% CI [5.03, 5.28]) scored higher than both pediatrics residents (mean=4.94, 95% CI [4.70, 5.19], p=0.041) and pathology residents (mean=4.84, 95% CI [4.44, 5.29], p=0.037) in emotion management. Other pairwise comparisons were not statistically significant at the $p<.05$ level.

Across all specialties, men (n=55) and women (n=84) resident physicians were statistically significantly different in two TEIQue factors and six TEIQue facets (Table 11). Women residents scored statistically significantly higher than men in emotionality factor (5.38 vs 5.14, p=0.044), impulse control (5.17 vs. 4.70, p=0.004), empathy (5.58 vs. 5.33, p=0.049), relationships (5.85 vs. 5.50, p=0.004), and self-motivation (5.31 vs. 5.05, p=0.035). Men scored statistically significantly higher than women in sociability factor (5.19 vs. 4.94, p=0.034), stress management (5.17 vs. 4.82, p=0.008), and emotion management (5.33 vs. 5.04, p=0.023). Global EI was not significantly different between men and women (p=0.74).

Within surgery, men (n=39) and women (n=46) resident physicians were statistically significantly different in three TEIQue facets (Table 12). Women scored higher than men in

impulse control (5.21 vs. 4.62, p=0.006) and self-motivation (5.38 vs. 5.08, p=0.041), while men scored higher in stress management (5.33 vs. 4.88, p=0.008).

Global EI and demographic predictors

There was a small but significant correlation between resident physician age and Global EI (Figure 2, R^2=0.043, p=0.0072) as well as between training level (number of completed post-graduate years) and Global EI score (R^2=0.019, p=0.050). There was also very strong correlation between age and training level (R^2=0.20, $p<1.0x10^{-6}$), suggesting that these two variables are interchangeable. Stepwise linear regression demonstrated that of the demographic variables age, gender, specialty, training level, only age had a statistically significant predictive relationship with Global EI, though the effect was small (*B*=.033, p=0.014). The number of completed post-graduate years was not a significant predictor of global EI within this stepwise model (p=0.53) in contrast to the correlation analysis finding above. A stepwise linear regression that substituted training level with a calibrated training level was conducted in order to account for the difference in typical training lengths of the different residency programs. This analysis also showed a non-significant effect of training level and Global EI (p=0.72).

DISCUSSION

Findings

Emotional intelligence profiles – all specialties

Overall, the resident physicians who participated in this study demonstrated Global EI similar to that of the general population. This is in contrast to the findings of a prior study in surgical residents, in which the residents scored higher than the general population (Jensen et al., 2008). Our findings are, however, consistent with findings in family medicine residents who demonstrated average overall EI (Webb et al., 2010). The variability of Global EI was lower than that of the general working population, which indicates that resident physicians are more similar to each other in Global EI than the individuals who constitute the norm group. The smaller standard deviation of Global EI may reflect that medicine is a highly competitive career and that resident physicians represent the subset of aspiring physicians who have successfully navigated selection processes including medical school admission and residency matching. Despite the Global EI score of the residents being average, there were distinct areas of high and low development relative to the general population sample (Table 13). Residents scored highly in self-esteem, impulse control, empathy, emotional management, and self-motivation. These areas of strengths may represent the characteristics valued in future physicians and which are therefore selected for through the various stages of medical training; they may also reflect the areas of EI most practiced and therefore developed during medical training. Interestingly, the resident physicians in this study scored low on social awareness and adaptability. Individuals who score highly in social awareness perceive themselves as excellent networkers and negotiators, skills which may be more honed and valued in other professional settings such as business or law but which would certainly also be valuable in a medical practice. The low score in adaptability may not be surprising given that medicine is a well-defined, stable career path

with many set milestones and junctions—this career characteristic may draw individuals with lower tolerance for change and uncertainty.

Group comparisons – three specialties

The Global EI was not statistically significantly different between specialty groups, a finding which leads to a rejection of the hypothesis that pediatrics residents have higher global EI than that of the surgery residents. The lack of differences in overall EI is consistent with the finding that the EI profiles of medical students who matched into different programs were not significantly different (Borges et al., 2009). However, each specialty and gender group demonstrated distinct areas of high and low development, which indicates that while each group is equally developed overall with regard to managing the emotions of self and others, the particular strengths and weaknesses which contribute to that average global EI are different. One-way ANOVA revealed a main effect of specialty on one TEIQue factor and five TEIQue facets, a finding which supports the conclusion that the EI profiles of resident physicians from different specialties are different. One possible way to explain this finding is to hypothesize that senior medical students with different areas of high and low areas of EI development may self-select into different specialties. Alternately, specialty-specific training may lead to the development of a particular EI profile. It is also possible that the differing EI profiles of the different specialty groups result from a combination of both self-selection and training effects.

The different subcomponent EI scores across different medical specialties has several important educational implications. The first is that when program directors consider the ways in which they can support the development of their residents, different programs may benefit from different types of training. For example, within this study the pediatric/med-peds group scored low in assertiveness and high in empathy, which suggests that resident physicians in this

residency program may benefit more from interventions that arm them with behavioral strategies to become more skilled in negotiation and conflict management compared to interventions aimed at increasing empathy. Another possible educational implication concerns career selection—are individuals with certain personal characteristics more suited for one specialty than another? For example, only the pathology group scored extremely highly in impulse control, raising the possibility that impulse control is important in pathology. While more research would be required, one might hypothesize that individuals whose EI profiles are extremely different from the "norm" of their intended specialty or residency program may experience difficulties either based on the particular demands of that field/program or in being a member of that specialty/residency.

On the other hand, the wide range of scores on each individual facet within each specialty indicates that there is room for a diverse range of EI profiles within each specialty or training program. Without performance measurements, it is impossible to ascertain whether residents whose EI profiles are very similar or dissimilar to a group norm perform very well or poorly. Much of the interest in EI in medical training pertains to its potential value as an additional predictor in subsequent performance either on the medical school or residency level (Carrothers et al., 2000; Leddy et al., 2011; Lin et al., 2013; Talarico et al., 2008; Talarico et al., 2013). Extension of the present study to incorporate evaluation of the work performance characteristics of participating resident physicians could contribute to current knowledge of the predictive power of EI on clinical performance.

Group comparisons – gender differences

Across all specialties, men and women residents scored similarly on Global EI, a finding which counters our hypothesis and stands in contrast to the finding that women have higher

overall EI than men in several studies of medical students and medical school applicants (E. J. Austin et al., 2005; E. J. Austin et al., 2007; Carrothers et al., 2000; Leddy et al., 2011; Stratton et al., 2008). This finding is, however, consistent with other studies within the context of medical training either at the medical school or residency level that have found no gender differences in overall EI (Jensen et al., 2008; Kilpatrick et al., 2012; Lin et al., 2013; Satterfield et al., 2009). Just as with the different specialties, the two gender groups scored average in Global EI with distinct areas of high and low scores relative to the norm sample, indicating that distinct combinations of strengths and weaknesses contribute to the overall normal Global EI score for men and women resident physicians (Table 14).

That there are gender differences is not surprising given that there are gender differences for the majority of TEIQue factors and facets. Within a large norm sample of 857 women and 959 men analyzed by Petrides, there were statistically significant differences at the $p<.001$ level between men and women in 3 of the 4 TEIQue factors and 11 of 15 TEIQue facets (K. V. Petrides, 2012). Women also scored significantly higher than men in Global EI score at the $p<.001$ level in the norm sample. The areas in which male residents scored higher than female residents, stress management and emotion management, are areas in which men in the general population score higher than women in the general population. Just as women in the general population score higher than men in emotionality factor, empathy, and relationships, female residents in the present study scored higher than male residents in these facets. Contrary to the norm sample, women resident physicians also scored higher than men in impulse control and self-motivation. Thus, while there are fewer gender differences in the present study than in the norm population, these gender differences mostly mirror those found in the general population sample.

There are several potential explanations for why men and women residents score more similarly in EI than men and women in the general population. The first is that the study group has self-selected to medicine, that is, that medicine appeals as a career choice to a particular subset of the general population and those individuals who are attracted to medicine share a set of common characteristics regardless of whether they are men or women. The second is that selection processes select for individuals with a particular EI profile regardless of gender. Finally, men and women undergo the same training to become physicians, and there may be effects of training on EI which erode gender differences by molding men and women towards a common type with regard to particular facets of emotional intelligence. For example, emotion expression is a TEIQue facet with significant gender differences within the general population (Women: mean=5.07, SD=1.23; Men: mean=4.84, SD=1.18, $p<.001$, K. V. Petrides, 2012). Within this study, however, there was no effect of gender on emotion expression (Women: mean=4.94, SD=1.25; Men: mean=4.80, SD=1.21, $p=0.53$). The absence of a typical gender difference may be a result of selection, but it may also be the case that women who entered medical school learned over time to suppress emotional expression to the point of eliminating this distinction with men.

One consideration when examining gender differences is the effect of specialty: given uneven gender representation within certain specialties such as pediatrics, it is possible that gender differences merely reflect the fact that different specialties have different proportions of men and women residents. Within the group of surgery resident physicians alone, there were three statistically significant EI gender differences within this group, fewer than in the entire study sample and far fewer than in the general population sample. This finding suggests that within a given specialty, men and women resident physicians are even more similar than men and women resident physicians across all specialties and much more similar than men and

women in the general working population. Again, the observation that men and women in surgery are so similar could result from self-selection, selection processes, or training effects. Importantly, these findings contribute to the literature on barriers to women's advancement in academic surgery by demonstrating that at least within this sample group, men and women residents are extremely similar with regard to trait emotional intelligence and that differences in promotion would not likely be attributable to differences in emotion management characteristics (Cochran, Elder, et al., 2013; Cochran, Hauschild, et al., 2013; Colletti, Mulholland, & Sonnad, 2000).

Still, the presence of any gender differences in the resident group at large and within surgery alone indicates that men and women resident physicians may differentially benefit from targeted EI interventions, as is the case in the general population. When considering educational programming aimed at developing particular domains of emotional intelligence, program directors may want to select either areas in which both genders demonstrate low scores or a combination of areas which address some weaknesses of men and some weaknesses of women. The goal of any EI intervention targeted at low-development areas would be to arm residents with behavioral strategies that will enhance their ability to engage skills other than those that they are typically inclined to use. Essentially, development of weak EI domains may enable enhanced performance by giving the resident physician greater flexibility through increasing the types of emotion management tools available to him or her. Different clinical and professional situations may be most effectively handled with different EI strategies, so a resident with increased comfort in selecting from a greater number of emotion management skills may have increased effectiveness. Therefore, choosing to focus exclusively on EI domains that are already strong for either men or women may not optimize the educational impact of such interventions in supporting the well-rounded development of resident physicians.

Global EI and demographic predictors

Stepwise linear regression identified only age as a significant demographic predictor of Global EI with a possible increase in Global EI with every year in training. This increase may not be a consequence of the training itself, but rather the accumulation of another year of life experience. According to this model, older residents at the same training level as younger residents will have higher Global EI, possibly due to the additional life experience accumulated prior to entering residency training. The educational implication is that program directors may need to provide more development support to younger residents or consider that older applicants may have stronger overall trait emotional intelligence than younger applicants. A longitudinal study would be required to definitively link age/training year with an increase in EI.

Overall study implications

There is an increasing call for incorporating emotional intelligence into medical training due to its demonstrated value within the business community and the fact that medicine is an inherently emotionally demanding career (Grewal & Davidson, 2008; Lewis et al., 2005; Taylor et al., 2011). However, there are few studies that offer guidance on whether or how to incorporate EI into graduate medical education.

This thesis is among the first studies to describe the trait emotional intelligence profiles of men and women residents in different specialties and to investigate whether there are significant inter-specialty or gender differences in trait EI. This study also demonstrates that a trait emotional intelligence tool may be used as an educational needs assessment to discriminate between areas of strength and areas of potential development for a given residency group, even when that group demonstrates overall average Global EI. The presence of low scores indicates that residents may benefit from targeted emotional intelligence training and development with

the goal of increasing a resident's comfort in employing EI areas other than his/her present strengths. That different specialties display different patterns of high and low development indicates that program directors and medical educators must carefully choose which skills to target depending on the specialty and gender of the intended audience. There is no universal emotional intelligence development target among resident physicians, and any intervention must be tailored either to an individual resident or to a particular resident group.

The findings in this thesis also suggest that program directors should administer baseline trait EI assessment of their residents prior to selecting and administering any educational interventions aimed at particular EI domains in order to ensure that they are targeting the appropriate areas. The >40% survey completion rate also demonstrates that there is a demand among residents for greater self-knowledge. EI assessment on its own may prove beneficial to the development of residents through increasing their self-awareness of personal strengths and weaknesses, especially given that self-awareness has been proposed as the first curricular element of a using EI to teach the critical, non-technical skills of medicine (Taylor et al., 2011). In summary, this study has begun to reveal the potential educational power and value of incorporating trait EI profiling into graduate medical education and provides a baseline study from which many additional research inquiries can proceed.

Limitations of study

Two significant study limitations are the response rate and number of study participants. The overall response rate of resident physicians was 42.8%, which falls short of the 70% response rate considered the gold standard when asserting the validity of survey results. Of note is that the response rate in the current study is comparable to the average response rate of surveys administered to general surgery residents as determined in a recent literature review, which

suggests that the results are as valid as the average survey-based publication of resident physicians (Yarger et al., 2013). Still, the variability of response rate between programs is concerning for the possibility that the EI profiles of the different specialties are differentially valid. For example, the response rate of pathology residents was 60% compared to the 38.5% response rate of surgery residents. This difference in response rate raises the possibility that the EI profile of resident physicians in surgery is more susceptible to self-selection bias and therefore may be a less accurate representation of the group as a whole.

The number of residents who participated in the study is also a potential study limitation, especially when one considers that multiple groups are represented. The 139 residents who participated can be characterized by gender, specialty, program, and training level. Individual demographic groups are therefore quite small and dilute the power of potential analyses. For example, this study would not provide adequate power to study the interaction between specialty and gender on EI scores: there are only seven men in the pediatrics/med-peds group, and despite the gender balance of the pathology group, splitting this specialty by gender would lead to two groups of only 11 individuals. Given that a specialty by gender analysis would lead to weakening of statistical power, the effect of gender and specialty on EI scores was examined in two separate one-way ANOVAs and a two-way ANOVA was not done to examine for an interaction effect. Distinguishing the effect of gender versus specialty is important because the gender make-up of different specialties may be distinct. It is known that nationally >70% of pediatric residents are women while approximately 35% of surgery residents are women (Cochran, Hauschild, et al., 2013; Frintner & Cull, 2012). Splitting gender groups or specialties by training level would also have led to small group sizes and reduced statistical power. A follow-up study would require a much greater number of participants in order to conduct analyses which account for the interaction of gender, specialty, and training level. Such a study

would also increase the generalizability of the results. In the present study, pathology and pediatric/med-peds residents were each recruited from only a single institution, which undermines how generalizable the findings would be to pathology and pediatrics/med-peds residents in other residency programs. Across all threes specialties, participants were recruited exclusively from large academic centers, which may mean that the findings are not generalizable to residents in smaller community-based training programs.

An additional limitation of the study regards the choice to employ the TEIQue, a trait emotional intelligence tool. Employing a tool based on the trait-conception of emotional intelligence is appropriate for a study whose primary method involves self-assessment, because self-rating is a valid source of information regarding an individual's personal disposition and self-perceptions with regard to the experience of emotion. However, such a questionnaire does not provide insight into behavior or competence—the question of how well a person actually manages his/her emotions and the emotions of others is not answered through a trait emotional intelligence tool. Conclusions about actual resident performance cannot be made from TEIQue EI scores. Though it is reasonable to imagine that residents who score very low in trait assertiveness are more likely to experience performance improvement after a negotiation workshop than residents with average assertiveness scores, it is an untested assumption that scoring low or high on TEIQue measures necessarily correlates with lower or higher performance outcomes. A related limitation of the study was the absence of a clinical performance variable, that is, there was no measure of a resident physician's competence such as faculty evaluation or in-training exam score. The relationships between TEIQue EI scores and resident physician work performance characteristics cannot be determined based on the collected data.

Potential future work

This thesis describes a cross-sectional study of the EI of men and women resident physicians in three specialty programs. Future work could 1) increase the present study's size for greater statistical power or 2) incorporate new variables/design to address additional research questions.

Expanding the study to other institutions may increase the sample size of each specialty group and consequently increase the statistical power of the study to discern differences between specialty groups, genders, and training levels. Increasing the number of study participants would also allow for additional analyses such as two-way ANOVA that would examine the interaction between demographic variables. The generalizability of the present study would be improved by increasing the size of the study. In particular, recruiting pathology and pediatric residents from other institutions would strengthen the generalizability of the EI profiles we report for these groups of resident physicians.

The collection of new data would be another way to expand the present study design and expand the investigational scope. One avenue of research might examine resident perceptions of the utility of EI assessment and/or personalized score reports. In addition to a traditional survey, qualitative research methods such as semi-structured interviews or focus groups might generate the kind of data necessary to develop a rich understanding of whether the residents who participated in this present study found the reports valuable or whether they have since made any self-development efforts in particular EI domains. If program directors chose to incorporate EI assessment as a standard part of training, these qualitative methods would be an excellent way to capture trainee attitudes regarding the best way to incorporate EI assessment and development into residency training. Residents may have strong preferences with regard to the method of

delivery of EI results and/or the level of confidentiality afforded to EI score reports. Residents may also communicate their desire for EI development via particular vehicles such as paper handouts, on-demand webinars, or small group workshops. Given the failure of one published attempt at a resident physician EI development program, such a qualitative study would be important for designing an EI intervention that is likely to succeed with strong participation and completion rates (Webb et al., 2010).

It would also be possible to extend the current study by conducting some type of emotional intelligence development training and then administering a second EI assessment to residents. This EI development intervention could be "off-the-shelf" in the sense that it could be a commercial product purchased from a corporate entity, or it could be a "homemade" program developed after conducting the type of investigation described above. Using the present study's data as a baseline measure of resident physician EI, several new analyses would be possible including: a comparison of group EI profiles pre and post intervention, comparison of changes in EI between residents who participated in the intervention and residents who did not participate, and comparison of resident clinical performance pre and post intervention. Resident attitudes regarding the utility of the EI intervention could also be studied, or residents could be queried on any changes they have made since participating in the EI development program.

Another way to expand the current study would be to omit the step of creating or administering an EI development intervention but still collect data on resident performance in some form, perhaps faculty evaluations, 360˚ evaluations from medical students, co-residents, and nurses, or in-training exam scores. Ideally, these clinical performance measures would be from the time of this study's TEIQue administration or from the following months and emphasize measurement of the ACGME competencies. This design could help determine if

TEIQue EI scores have any correlation with contemporaneous residency performance characteristics or whether TEIQue EI scores have any predictive value in subsequent clinical evaluations. EI may prove to be highly valuable in determining whether a resident is adequately progressing in the ACGME competencies, as suggested by others (Arora et al., 2010; Talarico et al., 2013). One challenge in this type of study is that different residency programs may use different types of evaluation to assess resident performance, and the quality of documented evaluation may be limited, poor, and unreliable. Standardized exam scores might be one form of more objective performance assessment, but we would not necessarily expect that fund of knowledge is the performance domain with the strongest relationship or dependence on the ability to manage emotion. One performance outcome which might be of great interest to program directors is attrition: are the EI profiles of residents who leave residency different in some way from the residents who complete residency? Duckworth's research on grit, defined as "perseverance and passion for long term goals," has been demonstrated to add predictive power to performance outcomes of a variety of groups including Ivy League students and West Point cadets (Duckworth, Peterson, Matthews, & Kelly, 2007; Duckworth, Quinn, & Seligman, 2009). One could investigate whether different factors or facets of EI profiles have any predictive validity for leaving residency.

Adopting a different study design would also enable the investigation of completely different kinds of research questions. This present study was cross-sectional in nature in order to describe EI profiles of different types of resident physicians at a specific period of time. Conducting a longitudinal study would allow for repeated measures of the same individuals at different time points and illuminate whether EI changes across training. By including different disciplines, one could imagine posing the question of whether resident physicians in different specialties start intern year with identical profiles which then diverge across time, or whether

interns in different specialties begin with distinct EI profiles. The only study which attempted to address this question was unable to find differences in the EI of medical students who would ultimately pursue different fields, though the study was limited in that data were not originally collected for this purpose and were pooled from three different studies using a variety of EI measurement tools (Borges et al., 2009). Initiating a study with the intent of conducting longitudinal data collection would provide a more robust investigation into whether different groups of trainees develop EI differently or were self-selected into distinct groups from the start. Longitudinal data may shed light on whether there are areas of trait emotional intelligence in which residents become more developed over time and whether the development in EI parallels improvement in clinical competence. The data may also illuminate whether facets of EI are eroded through training, a distinct possibility given the body of literature demonstrating a detrimental effect of clinical training on measures of empathy in medical students and residents (Bellini, Baime, & Shea, 2002; Bellini & Shea, 2005; M. Hojat et al., 2009; Neumann et al., 2011).

SUMMARY AND CONCLUSIONS

The concept of emotional intelligence (EI) has gained prominence within the business world through academic literature that demonstrates a relationship between EI and work performance characteristics. Given that a career in medicine requires the adept identification and response to human emotion, there is an increasing interest in the role that emotional intelligence may have in medical training and practice. Few studies, however, have compared the emotional intelligence of resident physicians in different specialties or examined whether gender differences of resident physicians mirrors those found in the general population.

This thesis describes a study of the emotional intelligence of men and women residents across three specialties. Contrary to initial hypotheses, there was no difference between specialties or between genders in Global EI. However, each specialty did demonstrate a distinct EI profile which suggests that residents of different specialties may benefit from educational interventions that target different areas of EI. Men and women also displayed different areas of high and low EI development, though there were fewer gender differences between men and women residents than between the men and women in the general population sample. This finding suggests that a career in medicine either selects for individuals with a particular profile or erodes gender differences as a consequence of training. Finally, age but not training level has a statistically significant predictive relationship with Global EI, which may mean that it is the accumulation of life experience across time and not necessarily residency activities which lead to the development of greater EI. Future research should explore the predictive relationship between EI and clinical performance and determine whether educational interventions aimed at the development of particular EI domains leads to enhanced resident attainment of the ACGME competencies.

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Scale/subscale	Definition
Intrapersonal	(self-awareness and self-expression)
- Self-Regard	To accurately perceive, understand and accept oneself
- Emotional Self-Awareness	To be aware of and understand one's emotions
- Assertiveness	To effectively and constructively express one's emotions and oneself
- Independence	To be self-reliant and free of emotional dependency on others
- Self-actualization	To strive to achieve personal goals and actualize one's potential
Interpersonal	(social awareness and interpersonal relationship)
- Empathy	To be aware of and understand how others feel
- Social Responsibility	To identify with one's social group and cooperate with others
- Interpersonal Relationship	To establish mutually satisfying relationships and relate well with others
Stress Management	(emotional management and regulation)
- Stress tolerance	To effectively and constructively manage emotions
- Impulse Control	To effectively and constructively control emotions
Adaptability	(change management)
- Reality-testing	To objectively validate one's feelings and thinking with external reality
- Flexibility	To adapt and adjust one's feelings and thinking to new situations
- Problem-solving	To effectively solve problems of a personal and interpersonal nature
General Mood	(self-motivation)
- Optimisim	To be positive and look at the brighter side of life
- Happiness	To feel content with oneself, others and life in general

Table 1. Bar-on Emotional Quotient Inventory (EQ-i)
Description of composite scales and content subscales. (R. Bar-On, 2006)

Factor/Facet	High scorers perceive themselves as…
Well-Being	…possessing a generalized sense of well-being, feeling positive, happy, and fulfilled.
- Happiness	…cheerful and satisfied with their lives.
- Optimism	…confident and likely to "look on the bright side" of life.
- Self-esteem	…successful and self-confident.
Sociability	…able to communicate clearly and confidently with people from very diverse backgrounds
- Assertiveness	…forthright, frank, and willing to stand up for their rights.
- Emotional management	…capable of influencing other people's feelings.
- Social awareness	…accomplished networkers with excellent social skills.
Emotionality	…skilled in a wide range of emotion-related activities.
- Relationship	…capable of having fulfilling personal relationships.
- Empathy	…capable of taking someone else's perspective.
- Emotion perception	…clear about their own and other people's feelings.
- Emotion expression	…capable of communicating their feelings to others.
Self-Control	….having a healthy degree of control over their urges and desires.
- Emotion regulation	…capable of controlling their emotions.
- Impulse control	…reflective and less likely to give in to their urges.
- Stress management	…capable of withstanding pressure and regulating stress.
Independent Facets	
- Adaptability	…flexible and willing to adapt to new conditions.
- Self-motivation	…driven and unlikely to give up in the face of adversity.

Table 2. TEIQue Facet and Factor Descriptions
The 153 items of the TEIQue generate scores for 15 distinct emotional intelligence factors, which then cluster to 4 broader emotional intelligence factors. Descriptions of each facet and factor have been adapted from the Trait Emotional Intelligence Questionnaire Technical Manual (K. V. Petrides, 2012).

	All residents	MGH Pathology	MGH Peds & Med-peds	All Surgery	BIDMC Surgery	BWH Surgery	MGH Surgery
Response Rate	42.8% (139/325)	60.0% (21/35)	47.8% (33/69)	38.5% (85/221)	29.3% (22/75)	36.9% (23/65)	48.1% (39/81)
% Gender (#)							
Male	39.6% (55)	42.9% (9)	21.2% (7)	45.9% (39)	50.0% (11)	29.2% (7)	53.8% (21)
Female	60.4% (84)	57.1% (12)	78.8% (26)	54.1%(46)	50.0% (11)	70.8% (17)	46.2% (18)
Mean age years	30.1	30.8	29.5	30.2	30.9	29.7	30.2
% Highest Completed PGY (#)							
None	21.6% (30)	19.0% (4)	21.2% (7)	22.4% (19)	22.7% (5)	33.3% (8)	15.4% (6)
PGY1	19.4% (27)	33.3% (7)	30.3% (10)	11.8% (10)	13.6% (3)	8.3% (2)	12.8% (5)
PGY2	28.8% (40)	28.6% (6)	33.3% (11)	27.1% (23)	45.5% (10)	20.8% (5)	20.5% (8)
PGY3	20.1% (28)	4.8% (1)	12.1% (4)	27.1% (23)	13.6% (3)	20.8% (5)	38.5% (15)
PGY4	7.2% (10)	9.5% (2)	3.0% (1)	8.2% (7)	0.0% (0)	16.7% (4)	7.7% (3)
PGY5	2.9% (4)	4.8% (1)	0.0% (0)	3.5% (3)	4.5% (1)	0.0% (0)	5.1% (2)

Table 3. Demographic characteristics of study participants by residency program
Data are expressed as percentages (number).

All Residents, n=139	Mean	Std Dev	Minimum	Maximum
Global EI	101.0	8.1	82.6	122.3
Well-Being factor	101.7	11.1	70.8	124.0
Self-control factor	102.6	9.5	78.5	128.8
Emotionality factor	101.5	12.6	70.5	131.2
Sociability factor	98.9	11.5	69.0	131.7
Happiness	102.7	13.2	65.3	120.0
Optimism	101.0	13.6	65.7	124.9
Self-esteem	103.0 (H)	12.2	70.1	130.7
Emotion regulation	102.4	12.5	66.2	134.6
Impulse control	103.0 (H)	14.1	58.6	134.2
Stress management	102.8	11.0	74.0	128.4
Empathy	104.8 (H)	13.6	65.7	134.0
Emotion perception	101.7	15.5	60.1	133.3
Emotion expression	99.2	15.3	62.2	125.4
Relationships	102.5	13.3	59.5	127.0
Emotional management	105.6 (H)	10.8	62.5	132.8
Assertiveness	97.6	14.5	63.3	130.6
Social awareness	96.7 (L)	13.9	63.7	128.9
Self-motivation	104.7 (H)	13.1	72.6	134.5
Adaptability	95.9 (L)	11.7	69.9	126.7

Table 4. Emotional intelligence profile of all residents across specialties.
Data are expressed as standardized scores, for which the large general population sample has mean=100 and SD=15 on each score. Standardized scores >103 and <97 are considered areas of high and low development relative to a general population sample, respectively. (H) denotes an area of relative high development; (L) denotes an area of relative low development.

Pathology, n=21	Mean	Std Dev	Minimum	Maximum
Global EI	99.1	7.9	95.6	122.3
Well-Being factor	99.0	10.7	70.8	116.8
Self-control factor	102.9	7.4	90.3	123.9
Emotionality factor	101.1	12.2	78.7	131.2
Sociability factor	93.6 (L)	13.3	69.0	129.9
Happiness	100.8	13.1	73.1	120.0
Optimism	93.7 (L)	13.4	65.7	115.1
Self-esteem	103.3 (H)	12.1	74.6	120.1
Emotion regulation	101.6	11.7	78.1	129.4
Impulse control	107.6 (H)	10.9	74.0	123.9
Stress management	100.7	9.1	76.9	118.1
Empathy	105.8 (H)	13.6	76.4	134.0
Emotion perception	99.8	16.3	72.9	133.3
Emotion expression	98.4	13.5	75.8	122.9
Relationships	103.4 (H)	11.6	78.4	127.0
Emotional management	101.4	13.6	62.5	129.5
Assertiveness	93.2 (L)	18.5	63.3	130.6
Social awareness	90.5 (L)	12.9	68.1	127.4
Self-motivation	102.8	13.4	74.5	125.1
Adaptability	92.2 (L)	11.4	71.7	113.4

Table 5. Emotional intelligence profile of pathology resident physicians.
Data are expressed as standardized scores, for which the large general population sample has mean=100 and SD=15 on each score. Standardized scores >103 and <97 are considered areas of high and low development relative to a general population sample, respectively. (H) denotes an area of relative high development; (L) denotes an area of relative low development.

Surgery, n=85	Mean	Std Dev	Minimum	Maximum
Global EI	101.7	8.3	83.4	119.7
Well-Being factor	102.1	11.8	83.4	124.0
Self-control factor	103.7 (H)	10.2	72.0	128.8
Emotionality factor	100.7	13.0	78.5	122.5
Sociability factor	101.3	10.8	70.5	131.7
Happiness	102.3	14.0	65.3	120.0
Optimism	101.8	13.5	65.7	125.0
Self-esteem	103.7 (H)	12.4	70.1	130.7
Emotion regulation	104.1	12.8	70.2	134.6
Impulse control	102.4	15.4	58.6	134.2
Stress management	104.6 (H)	11.6	74.0	128.4
Empathy	103.4 (H)	13.9	65.7	131.9
Emotion perception	102.7	16.2	60.1	133.3
Emotion expression	98.2	16.4	62.2	124.2
Relationships	100.9	13.6	59.5	122.7
Emotional management	107.8 (H)	9.8	83.8	132.8
Assertiveness	100.1	13.3	70.4	130.6
Social awareness	98.7	14.4	63.6	128.9
Self-motivation	105.3 (H)	12.6	74.5	134.5
Adaptability	97.3	11.8	69.9	126.7

Table 6. Emotional intelligence profile of surgery resident physicians.
Data are expressed as standardized scores, for which the large general population sample has mean=100 and SD=15 on each score. Standardized scores >103 and <97 are considered areas of high and low development relative to a general population sample, respectively. (H) denotes an area of relative high development; (L) denotes an area of relative low development.

Pediatrics & Med-Peds, n=33	Mean	Std Dev	Minimum	Maximum
Global EI	100.3	7.6	82.6	115.6
Well-Being factor	102.4	9.8	75.6	119.2
Self-control factor	99.6	8.5	80.9	119.9
Emotionality factor	103.7 (H)	11.6	72.5	130.2
Sociability factor	96.1 (L)	10.6	75.3	117.9
Happiness	105.1 (H)	11.0	75.1	120.0
Optimism	103.5 (H)	12.7	75.6	123.0
Self-esteem	101.1	12.0	77.6	129.2
Emotion regulation	98.4	11.5	66.2	122.8
Impulse control	101.7	11.7	79.2	125.6
Stress management	99.4	9.7	81.3	128.4
Empathy	107.8 (H)	12.8	74.2	134.0
Emotion perception	100.4	13.3	67.4	126.0
Emotion expression	102.0	13.3	72.1	125.4
Relationships	106.1 (H)	13.0	74.2	127.0
Emotional management	102.5	10.2	82.1	124.6
Assertiveness	93.7 (L)	13.7	66.8	121.8
Social awareness	95.4 (L)	12.3	74.0	117.0
Self-motivation	104.2 (H)	14.5	72.7	127.0
Adaptability	94.7 (L)	11.5	71.7	126.7

Table 7. Emotional intelligence profile of pediatrics and med-peds resident physicians. Data are expressed as standardized scores, for which the large general population sample has mean=100 and SD=15 on each score. Standardized scores >103 and <97 are considered areas of high and low development relative to a general population sample, respectively. (H) denotes an area of relative high development; (L) denotes an area of relative low development.

All residents, n=139	Men, n=55				Women, n=84			
	Mean	SD	Min	Max	Mean	SD	Min	Max
Global EI	100.8	8.0	85.7	122.3	101.1	8.2	82.6	118.2
Well-Being factor	101.8	11.1	70.8	124.0	101.7	11.3	72	122.8
Self-control factor	102.7	10.2	79.5	128.8	102.6	9.2	78.5	123.4
Emotionality factor	98.9	12.8	70.5	131.2	103.1(H)	12.2	76.3	130.2
Sociability factor	101.4	10.8	84.0	131.7	97.3	11.8	69.0	121.9
Happiness	101.4	13.7	67.3	120.0	103.6(H)	12.9	65.3	120.0
Optimism	101.1	13.5	65.7	125.0	100.9	13.8	65.7	125.0
Self-esteem	104.3(H)	12.3	74.6	130.7	102.2	12.2	70.1	129.2
Emotion regulation	103.2(H)	13.2	72.8	134.6	101.8	12.1	66.2	132.0
Impulse control	98.6	15.7	58.6	134.2	105.9(H)	12.1	74.0	130.7
Stress management	105.8(H)	10.6	76.9	128.4	100.8	10.9	74.0	128.4
Empathy	102.0	14.6	65.7	134.0	106.6(H)	12.7	76.4	134.0
Emotion perception	99.3	15.4	60.1	133.3	103.3(H)	15.5	62.0	133.3
Emotion expression	98.1	15.0	64.7	122.9	99.8	15.6	62.2	125.4
Relationships	98.6	14.2	59.5	127.0	105.1(H)	12.0	65.8	127.0
Emotional management	108.2(H)	9.3	91.9	132.8	103.9(H)	11.5	62.5	124.6
Assertiveness	100.3	14.1	72.1	130.6	95.8(L)	14.6	63.3	125.3
Social awareness	98.5	14.1	63.6	128.9	95.5(L)	13.7	66.6	122.9
Self-motivation	101.8	13.5	74.5	127.0	106.6(H)	12.6	72.6	134.5
Adaptability	96.5(L)	11.4	71.7	126.7	95.6(L)	12.0	69.9	126.7

Table 8. Emotional intelligence men vs. women across all three specialties.
Data are expressed as standardized scores, for which the large general population sample has mean=100 and SD=15 on each score. Standardized scores >103 and <97 are considered areas of high and low development relative to a general population sample, respectively. (H) denotes an area of relative high development; (L) denotes an area of relative low development.

Surgery residents, n=85	Men, n=39				Women, n=46			
	Mean	SD	Min	Max	Mean	SD	Min	Max
Global EI	101.5	7.7	86.1	119.7	101.9	8.8	83.4	118.2
Well-Being factor	102.9	11.0	81.0	124.0	101.4	12.4	72.0	122.8
Self-control factor	103.8	10.2	79.5	128.8	103.6(H)	10.3	78.5	123.4
Emotionality factor	98.8	12.9	70.5	122.5	102.3	13.1	76.3	122.5
Sociability factor	102.3	10.8	84.0	131.7	100.5	10.9	81.1	121.9
Happiness	102.1	13.8	67.3	120.0	102.5	14.4	65.3	120.0
Optimism	103.0	12.1	77.6	125.0	100.8	14.7	65.7	125.0
Self-esteem	104.9	12.6	83.7	130.7	102.6	12.3	70.1	126.1
Emotion regulation	104.9	13.0	72.8	134.6	103.5(H)	12.8	70.2	132.0
Impulse control	97.4	16.9	58.6	134.2	106.5(H)	12.9	77.5	130.7
Stress management	108.2	9.9	82.8	128.4	101.6	12.1	74.0	124.0
Empathy	100.6	14.9	65.7	131.9	105.8(H)	12.7	82.8	131.9
Emotion perception	99.8	15.6	60.1	133.3	105.1(H)	16.5	62.0	133.3
Emotion expression	98.2	15.6	64.7	121.7	98.3	17.3	62.2	124.2
Relationships	98.5	14.5	59.5	122.7	103.0(H)	12.6	65.8	120.6
Emotional management	108.8	9.7	93.6	132.8	107.0(H)	10.0	83.8	124.6
Assertiveness	100.4	13.9	72.1	130.6	99.9	13.0	70.4	125.3
Social awareness	100.1	14.4	63.6	128.9	97.5	14.4	66.6	122.9
Self-motivation	102.3	12.6	74.5	127.0	107.9(H)	12.2	82.0	134.5
Adaptability	98.0	11.1	77.4	126.7	96.8(L)	12.5	69.9	124.8

Table 9. Emotional intelligence of men vs. women in surgical residency
Data are expressed as standardized scores, for which the large general population sample has mean=100 and SD=15 on each score. Standardized scores >103 and <97 are considered areas of high and low development relative to a general population sample, respectively. (H) denotes an areas of relative high development; (L) denotes an area of relative low development.

	Specialty								Post-hoc analysis		
	Pediatrics		Pathology		Surgery				Pair-wise comparison		
	Mean	SD	Mean	SD	Mean	SD	F(2,136)	p	Peds/ Path	Peds/ Surg	Path/ Surg
Global score	5.14	0.46	5.05	0.48	5.21	0.50	0.99	0.37			
Well-being factor	5.64	0.60	5.38	0.66	5.59	0.74	0.96	0.39			
Self-control factor	4.72	0.55	4.95	0.46	4.98	0.66	2.03	0.14			
Emotionality factor	5.41	0.62	5.27	0.64	5.24	0.70	0.75	0.48			
Sociability factor	4.86	0.63	4.72	0.78	5.18	0.64	5.51	0.005**	.74	.052	0.015*
Happiness	6.05	0.69	5.77	0.82	5.87	0.89	0.80	0.45			
Optimism	5.64	0.79	5.02	0.83	5.54	0.85	3.93	0.02*	0.025*	.81	0.035*
Self-esteem	5.23	0.71	5.36	0.71	5.38	0.74	0.52	0.59			
Emotion Regulation	4.54	0.72	4.74	0.72	4.90	0.81	2.63	0.08			
Impulse Control	4.90	0.74	5.28	0.69	4.94	0.99	1.35	0.26			
Stress Management	4.73	0.65	4.82	0.61	5.08	0.78	3.23	0.04			
Empathy	5.63	0.66	5.53	0.69	5.41	0.72	1.26	0.29			
Emotion Perception	5.00	0.72	4.97	0.87	5.12	0.88	0.42	0.66			
Emotion Expression	5.11	1.06	4.82	1.06	4.81	1.32	0.73	0.48			
Relationships	5.90	0.67	5.76	0.60	5.63	0.71	1.86	0.16			
Emotion Management	4.94	0.68	4.87	0.90	5.30	0.66	4.95	0.008**	0.041*	.93	0.037*
Assertiveness	4.69	0.84	4.66	1.13	5.09	0.83	3.56	0.03*	.99	.076	.12
Social Awareness	4.95	0.74	4.64	0.77	5.15	0.88	3.24	0.04*	.40	.47	0.039*
Self-motivation	5.18	0.76	5.11	0.70	5.24	0.67	0.34	0.72			
Adaptability	4.57	0.66	4.42	0.65	4.72	0.69	1.87	0.16			

Table 10. Results of one-way analysis of variance across specialties, with pairwise comparisons
Data are expressed as raw scores which fall on a 1-7 scale. Tukey post-hoc comparisons were conducted when there was a significant main effect of specialty. * denotes p<.05, **denotes p<.01

All specialties, n=139	Men, n=55		Women, n=84		p value
	Raw score	SD	Raw score	SD	
Global EI	5.15	0.48	5.18	0.50	0.74
Well-being factor	5.57	0.69	5.57	0.70	0.98
Self-control factor	4.90	0.67	4.92	0.60	0.89
Emotionality factor	5.14	0.70	5.38	0.67	0.044*
Sociability factor	5.19	0.65	4.94	0.71	0.034*
Happiness	5.81	0.88	5.95	0.82	0.32
Optimism	5.49	0.85	5.48	0.87	0.94
Self-esteem	5.41	0.74	5.29	0.73	0.33
Emotion Regulation	4.84	0.83	4.75	0.77	0.51
Impulse Control	4.70	1.01	5.17	0.78	0.004**
Stress Management	5.17	0.72	4.82	0.74	0.008**
Empathy	5.33	0.76	5.58	0.66	0.049*
Emotion Perception	4.94	0.84	5.16	0.85	0.14
Emotion Expression	4.80	1.21	4.94	1.25	0.53
Relationships	5.50	0.75	5.85	0.63	0.004**
Emotion Management	5.33	0.63	5.04	0.78	0.023*
Assertiveness	5.10	0.88	4.81	0.91	0.069
Social Awareness	5.13	0.87	4.95	0.84	0.22
Self-motivation	5.05	0.72	5.31	0.67	0.035*
Adaptability	4.67	0.67	4.62	0.71	0.66

Table 11. Emotional intelligence of men vs. women resident physicians across Data are expressed as raw scores which fall on a 1-7 scale. Women scored statistically significantly higher than men in emotionality factor, impulse control, empathy, relationships, and self-motivation. Men scored statistically significantly higher than women in sociability factor, stress management, and emotion management. * denotes $p<.05$, **denotes $p<.01$

Surgery residents, n=85	Men, n=39 Raw score	SD	Women, n=46 Raw score	SD	p value
Global EI	5.19	0.47	5.23	0.54	0.76
Well-being factor	5.64	0.68	5.56	0.77	0.60
Self-control factor	4.97	0.67	4.98	0.67	0.90
Emotionality factor	5.13	0.70	5.33	0.71	0.19
Sociability factor	5.24	0.65	5.13	0.66	0.47
Happiness	5.86	0.88	5.88	0.92	0.91
Optimism	5.61	0.76	5.47	0.93	0.45
Self-esteem	5.45	0.75	5.32	0.74	0.40
Emotion Regulation	4.95	0.82	4.86	0.81	0.61
Impulse Control	4.62	1.10	5.21	0.83	0.006**
Stress Management	5.33	0.67	4.88	0.82	0.008**
Empathy	5.26	0.77	5.53	0.66	0.09
Emotion Perception	4.97	0.85	5.26	0.90	0.14
Emotion Expression	4.81	1.26	4.81	1.39	0.98
Relationships	5.50	0.76	5.74	0.67	0.13
Emotion Management	5.37	0.66	5.25	0.68	0.42
Assertiveness	5.11	0.87	5.08	0.81	0.87
Social Awareness	5.23	0.88	5.08	0.88	0.42
Self-motivation	5.08	0.67	5.38	0.65	0.041*
Adaptability	4.76	0.65	4.69	0.73	0.64

Table 12. Emotional intelligence of men vs. women surgical residents
Data are expressed as raw scores which fall on a 1-7 scale. Women scored statistically significantly higher than men in impulse control and self-motivation. Men scored statistically significantly higher than women in stress management. * denotes $p<.05$, **denotes $p<.01$

	All residents	Pathology	MGH Peds & Med-peds	All Surgery
HIGH Development areas	Self-esteem Impulse control Empathy Emotional management Self-motivation	Self-esteem Impulse control Empathy Relationships	Emotionality factor Happiness Optimism Empathy Relationships Self-motivation	Self-control factor Self-esteem Stress management Empathy Emotional management Self-motivation
LOW Development areas	Social awareness Adaptability	Sociability factor Optimism Assertiveness Social awareness Adaptability	Sociability factor Assertiveness Social awareness Adaptability	

Table 13. High and Low Development areas across specialties
High development areas are defined as factors or facets with standardized score >103. Low development areas are defined as factors or facets with standardized scores <97.

	All men	All women	Men in surgery	Women in surgery
HIGH Development areas	Self-esteem Emotion regulation Stress management Emotional management	Emotionality factor Happiness Impulse control Empathy Emotion perception Emotional management Self-motivation	Self-control factor Optimism Self-esteem Emotion regulation Stress management Emotional management	Self-control factor Emotion regulation Impulse control Emotion perception Empathy Relationships Emotional management Self-motivation
LOW Development areas	Adaptability	Assertiveness Social awareness Adaptability		Adaptability

Table 14. High and Low Development areas across genders
High development areas are defined as factors or facets with standardized score >103. Low development areas are defined as factors or facets with standardized scores <97.

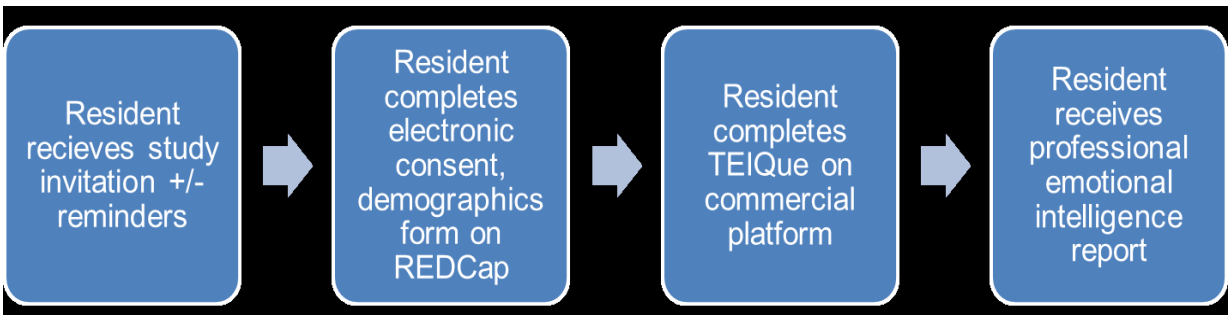

Figure 1. Study procedures
Data were collected using a hybrid method split between the Partners REDCap site and a commercial platform (www.thomasus.com).

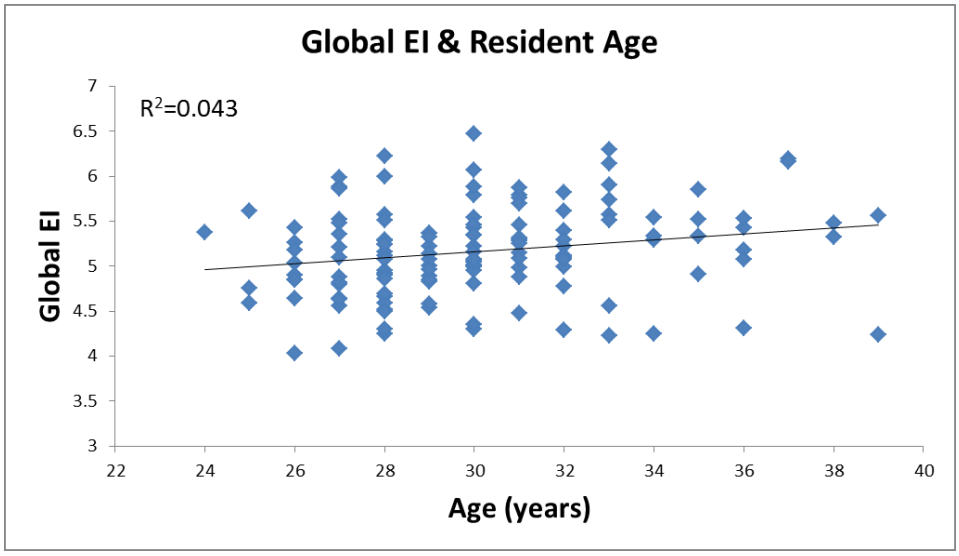

Figure 2. Global EI raw score and resident physician age (years)
Age had a small yet significant correlation with TEIQue Global EI raw score. R^2=.043, F(1,136)=6.158, p=0.0072

Appendix 1: Recruitment email

Dear Colleagues,

There has been increased interest in the role that emotional intelligence (EI) may have in both assessment and development of ACGME core competencies (Patient Care, Professionalism, Systems-based Practice, Interpersonal and Communication Skills, Medical Knowledge, and Practice-based Learning and Improvement). We are attempting to assess resident EI in order to create targeted interventions that may promote resident acquisition of these ACGME competencies. As a resident, you are invited to complete the following emotional intelligence questionnaire which consists of the Trait Emotional Intelligence Questionnaire (TEIQue) and the Personal Profile Analysis – DISC Assessment. Both are validated emotional intelligence and behavioral assessments.

We feel that one of the greatest benefits to study participation is receipt of emotional intelligence scores. As a result, your survey response will not be anonymous but will be linked to a randomly generated study identifier. You will receive a professionally prepared emotional intelligence report (value >$165) which is generated from non-identifiable data by a commercial third party. We are committed to the confidentiality of your responses; the only individual who will have access to identifiable data is an educator who has no supervisory role over resident physicians. No attending physician, including your program coordinator or department chair, will have access to identifiable data. All data will be made anonymous at the completion of the study.

Below is a link to participate in the study. You will first be asked to indicate electronic consent and provide demographic data. Within 48 hours of completing this initial portion, you will be sent a link to complete the TEIQue and the PPA - DISC on the Thomas International website (www.thomasus.com). No identifiers will be collected on this commercial website. The survey will take you approximately 23-33 minutes to complete.

Participation is voluntary and you may withdraw from the study at any time. Completing the survey acknowledges your consent to participate in this study.

Please contact the Principal Investigator, Dr. Roy Phitayakorn at (rphitayakorn@partners.org) should you have any concerns or questions about this project or the use of this data. If there are technical problems in filling out the survey itself, please contact the research coordinator Sophia McKinley (Sophia_McKinley@hms.harvard.edu). If you'd like to speak to someone not involved in this research about your rights as a research subject, or any concerns or complaints you may have about the research, contact the Partners Human Research Committee at 617-424-4100.

Thank you in advance for your participation.
Sincerely,
Roy Phitayakorn, MD
Principal Investigator

Residents: To complete the survey, click on the link below, or copy and paste the entire link into your browser:

UNIQUE LINK TO REDCAP SURVEY INSERTED HERE

Appendix 2: Electronic informed consent

There has been increased interest in the role that emotional intelligence (EI) may have in both assessment and development of ACGME core competencies (Patient Care, Professionalism, Systems-based Practice, Interpersonal and Communication Skills, Medical Knowledge, and Practice-based Learning and Improvement). We are attempting to assess resident EI in order to create targeted interventions that may promote resident acquisition of these ACGME competencies. As a resident, you are invited to complete the following emotional intelligence questionnaire which consists of the Trait Emotional Intelligence Questionnaire (TEIQue) and the Personal Profile Analysis – DISC Assessment. Both are validated emotional intelligence and behavioral assessments.

We feel that one of the greatest benefits to study participation is receipt of emotional intelligence scores. As a result, your survey response will not be anonymous but will be linked to a randomly generated study identifier. You will receive a professionally prepared emotional intelligence report (value >$165) which is generated from non-identifiable data by a commercial third party. We are committed to the confidentiality of your responses; the only individual who will have access to identifiable data is an educator who has no supervisory role over resident physicians. No attending physician, including your program coordinator or department chair, will have access to identifiable data. All data will be made anonymous at the completion of the study.

You will first be asked to indicate electronic consent and provide demographic data. Within 2-3 business days of completing this initial portion, you will be sent a link to complete the TEIQue and the PPA - DISC on the Thomas International website (www.thomasus.com). No identifiers will be collected on this commercial website. The survey will take you approximately 23-33 minutes to complete. Participation is voluntary and you may withdraw from the study at any time. Completing the survey acknowledges your consent to participate in this study.

Please contact the Principal Investigator, Dr. Roy Phitayakorn at (rphitayakorn@partners.org) should you have any concerns or questions about this project or the use of this data. If there are technical problems in filling out the survey itself, please contact the research coordinator Sophia McKinley (Sophia_McKinley@hms.harvard.edu). If you’d like to speak to someone not involved in this research about your rights as a research subject, or any concerns or complaints you may have about the research, contact the Partners Human Research Committee at 617-424-4100.

ELECTRONIC CONSENT: Please select your choice below. Clicking on the "agree" button below indicates that: - you have read the above information - you voluntarily agree to participate - you are at least 18 years of age If you do not wish to participate in the research study, please decline participation by clicking on the "decline" button.

☐ AGREE ☐ DECLINE

Appendix 3: Demographics survey hosted on REDCap

Demographics

What is your gender?	☐ Female ☐ Male
What is your age in years?	_____
What is your residency program?	☐ MGH Pathology ☐ MGH Pediatrics ☐ MGH Med-Peds ☐ MGH Surgery ☐ BWH Surgery ☐ BIDMC Surgery
As of July 1, 2013, what is the highest PGY-# that you have completed? Please only consider clinical years; do not include research, additional degrees etc...	☐ have not completed any PGY ☐ PGY-1 ☐ PGY-2 ☐ PGY-3 ☐ PGY-4 ☐ PGY-5 ☐ PGY-6
If you are graduating or are leaving your current residency program in the 4 weeks, please provide an email address to which we can send your professional prepared emotional intelligence reports.	_____

Appendix 4: Trait Emotional Intelligence Questionnaire (TEIQue)

Instructions

- *Please complete this questionnaire on your own and in quiet conditions*.
- *Please answer each statement below by putting a circle around the number that best reflects your degree of agreement or disagreement with that statement.* There are no right or wrong answers.
- *Work quickly, and don't think too long about the exact meaning of the statements.*
- *Try to answer as accurately as possible.*
- *You have seven possible responses, ranging from 1=Completely Disagree to 7=Completely Agree*
- *Many thanks for your time and interest*

		DISAGREE COMPLETELY						AGREE COMPLETELY
1.	I'm usually able to control other people	1	2	3	4	5	6	7
2.	Generally, I don't take notice of other people's emotions	1	2	3	4	5	6	7
3.	When I receive wonderful news, I find it difficult to calm down quickly	1	2	3	4	5	6	7
4.	I tend to see difficulties in every opportunity rather than opportunities in every difficulty	1	2	3	4	5	6	7
5.	On the whole, I have a gloomy perspective on most things	1	2	3	4	5	6	7
6.	I don't have a lot of happy memories	1	2	3	4	5	6	7
7.	Understanding the needs and desires of others is not a problem for me	1	2	3	4	5	6	7
8.	I generally believe that things will work out fine in my life	1	2	3	4	5	6	7
9.	I often find it difficult to recognise what emotion I'm feeling	1	2	3	4	5	6	7
10.	I'm not socially skilled	1	2	3	4	5	6	7
11.	I find it difficult to tell others that I love them even when I want to	1	2	3	4	5	6	7
12.	Others admire me for being relaxed	1	2	3	4	5	6	7
13.	I rarely think about old friends from the past	1	2	3	4	5	6	7
14.	Generally, I find it easy to tell others how much they really mean to me	1	2	3	4	5	6	7
15.	Generally, I must be under pressure to really work hard	1	2	3	4	5	6	7
16.	I tend to get involved in things I later wish I could get out of	1	2	3	4	5	6	7
17.	I'm able to "read" most people's feelings like an open book	1	2	3	4	5	6	7
18.	I'm usually able to influence the way other people feel	1	2	3	4	5	6	7
19.	I normally find it difficult to calm angry people down	1	2	3	4	5	6	7
20.	I find it difficult to take control of situations at home	1	2	3	4	5	6	7
21.	I generally hope for the best	1	2	3	4	5	6	7
22.	Others tell me that they admire me for my integrity	1	2	3	4	5	6	7
23.	I really don't like listening to my friends' problems	1	2	3	4	5	6	7
24.	I'm normally able to "get into someone's shoes" and experience their emotions	1	2	3	4	5	6	7
25.	I believe I'm full of personal weaknesses	1	2	3	4	5	6	7
26.	I find it difficult to give up things I know and like	1	2	3	4	5	6	7
27.	I always find ways to express my affection to others when I want to	1	2	3	4	5	6	7
28.	I feel that I have a number of good qualities	1	2	3	4	5	6	7
29.	I tend to rush into things without much planning	1	2	3	4	5	6	7
30.	I find it difficult to speak about my intimate feelings even to my closest friends	1	2	3	4	5	6	7
31.	I'm not able to do things as well as most people	1	2	3	4	5	6	7

32.	I'm never really sure what I'm feeling	1	2	3	4	5	6	7
33.	I'm usually able to express my emotions when I want to	1	2	3	4	5	6	7
34.	When I disagree with someone, I usually find it easy to say so	1	2	3	4	5	6	7
35.	I normally find it difficult to keep myself motivated	1	2	3	4	5	6	7
36.	I know how to snap out of my negative moods	1	2	3	4	5	6	7
37.	On the whole, I find it difficult to describe my feelings	1	2	3	4	5	6	7
38.	I find it difficult not to feel sad when someone tells me about something bad that happened to them	1	2	3	4	5	6	7
39.	hen something surprises me, I find it difficult to get it out of my mind	1	2	3	4	5	6	7
40.	I often pause and think about my feelings	1	2	3	4	5	6	7
41.	I tend to see the glass as half-empty rather than as half-full	1	2	3	4	5	6	7
42.	I often find it difficult to see things from another person's viewpoint	1	2	3	4	5	6	7
43.	I'm a follower, not a leader	1	2	3	4	5	6	7
44.	Those close to me often complain that I don't treat them right	1	2	3	4	5	6	7
45.	Many times, I can't figure out what emotion I'm feeling	1	2	3	4	5	6	7
46.	I couldn't affect other people's feelings even if I wanted to	1	2	3	4	5	6	7
47.	If I'm jealous of someone, I find it difficult not to behave badly towards them	1	2	3	4	5	6	7
48.	I get stressed by situations that others find comfortable	1	2	3	4	5	6	7
49.	I find it difficult to sympathize with other people's plights	1	2	3	4	5	6	7
50.	In the past, I have taken credit for someone else's input	1	2	3	4	5	6	7
51.	On the whole, I can cope with change effectively	1	2	3	4	5	6	7
52.	I don't seem to have any power at all over other people's feelings	1	2	3	4	5	6	7
53.	I have many reasons for not giving up easily	1	2	3	4	5	6	7
54.	I like putting effort even into things that are not really important	1	2	3	4	5	6	7
55.	I always take responsibility when I do something wrong	1	2	3	4	5	6	7
56.	I tend to change my mind frequently	1	2	3	4	5	6	7
57.	When I argue with someone, I can only see my point of view	1	2	3	4	5	6	7
58.	Things tend to turn out right in the end	1	2	3	4	5	6	7
59.	When I disagree with someone, I generally prefer to remain silent rather than make a scene	1	2	3	4	5	6	7
60.	If I wanted to, it would be easy for me to make someone feel bad	1	2	3	4	5	6	7
61.	I would describe myself as a calm person	1	2	3	4	5	6	7
62.	I often find it difficult to show my affection to those close to me	1	2	3	4	5	6	7
63.	There are many reasons to expect the worst in life	1	2	3	4	5	6	7
64.	I usually find it difficult to express myself clearly	1	2	3	4	5	6	7
65.	I don't mind frequently changing my daily routine	1	2	3	4	5	6	7
66.	Most people are better liked than I am	1	2	3	4	5	6	7
67.	Those close to me rarely complain about how I behave toward them	1	2	3	4	5	6	7
68.	ısually find it difficult to express my emotions the way I would like to	1	2	3	4	5	6	7
69.	Generally, I'm able to adapt to new environments	1	2	3	4	5	6	7
70.	often find it difficult to adjust my life according to the circumstances	1	2	3	4	5	6	7
71.	I would describe myself as a good negotiator	1	2	3	4	5	6	7
72.	I can deal effectively with people	1	2	3	4	5	6	7
73.	On the whole, I'm a highly motivated person	1	2	3	4	5	6	7
74.	I have stolen things as a child	1	2	3	4	5	6	7
75.	On the whole, I'm pleased with my life	1	2	3	4	5	6	7
76.	I find it difficult to control myself when I'm extremely happy	1	2	3	4	5	6	7
77.	Sometimes, it feels like I'm producing a lot of good work effortlessly	1	2	3	4	5	6	7
78.	When I take a decision, I'm always sure it is the right one	1	2	3	4	5	6	7

79.	If I went on a blind date, the other person would be disappointed with my looks	1	2	3	4	5	6	7
80.	I normally find it difficult to adjust my behaviour according to the people I'm with	1	2	3	4	5	6	7
81.	On the whole, I'm able to identify myself with others	1	2	3	4	5	6	7
82.	I try to regulate pressures in order to control my stress levels	1	2	3	4	5	6	7
83.	I don't think I'm a useless person	1	2	3	4	5	6	7
84.	I usually find it difficult to regulate my emotions	1	2	3	4	5	6	7
85.	:an handle most difficulties in my life in a cool and composed manner	1	2	3	4	5	6	7
86.	If I wanted to, it would be easy for me to make someone angry	1	2	3	4	5	6	7
87.	On the whole, I like myself	1	2	3	4	5	6	7
88.	I believe I'm full of personal strengths	1	2	3	4	5	6	7
89.	I generally don't find life enjoyable	1	2	3	4	5	6	7
90.	I'm usually able to calm down quickly after I've got mad at someone	1	2	3	4	5	6	7
91.	I can remain calm even when I'm extremely happy	1	2	3	4	5	6	7
92.	Generally, I'm not good at consoling others when they feel bad	1	2	3	4	5	6	7
93.	I'm usually able to settle disputes	1	2	3	4	5	6	7
94.	I never put pleasure before business	1	2	3	4	5	6	7
95.	Imagining myself in someone else's position is not a problem for me	1	2	3	4	5	6	7
96.	I need a lot of self-control to keep myself out of trouble	1	2	3	4	5	6	7
97.	It is easy for me to find the right words to describe my feelings	1	2	3	4	5	6	7
98.	I expect that most of my life will be enjoyable	1	2	3	4	5	6	7
99.	I am an ordinary person	1	2	3	4	5	6	7
100.	I tend to get "carried away" easily	1	2	3	4	5	6	7
101.	sually try to resist negative thoughts and think of positive alternatives	1	2	3	4	5	6	7
102.	I don't like planning ahead	1	2	3	4	5	6	7
103.	Just by looking at somebody, I can understand what he or she feels	1	2	3	4	5	6	7
104.	Life is beautiful	1	2	3	4	5	6	7
105.	I normally find it easy to calm down after I have been scared	1	2	3	4	5	6	7
106.	I want to be in command of things	1	2	3	4	5	6	7
107.	I usually find it difficult to change other people's opinions	1	2	3	4	5	6	7
108.	I'm generally good at social chit-chat	1	2	3	4	5	6	7
109.	Controlling my urges is not a big problem for me	1	2	3	4	5	6	7
110.	I really don't like my physical appearance	1	2	3	4	5	6	7
111.	I tend to speak well and clearly	1	2	3	4	5	6	7
112.	On the whole, I'm not satisfied with how I tackle stress	1	2	3	4	5	6	7
113.	Most of the time, I know exactly why I feel the way I do	1	2	3	4	5	6	7
114.	I find it difficult to calm down after I have been strongly surprised	1	2	3	4	5	6	7
115.	On the whole, I would describe myself as assertive	1	2	3	4	5	6	7
116.	On the whole, I'm not a happy person	1	2	3	4	5	6	7
117.	When someone offends me, I'm usually able to remain calm	1	2	3	4	5	6	7
118.	Most of the things I manage to do well seem to require a lot of effort	1	2	3	4	5	6	7
119.	I have never lied to spare someone else's feelings	1	2	3	4	5	6	7
120.	I find it difficult to bond well even with those close to me	1	2	3	4	5	6	7
121.	I consider all the advantages and disadvantages before making up my mind	1	2	3	4	5	6	7
122.	I don't know how to make others feel better when they need it	1	2	3	4	5	6	7
123.	I usually find it difficult to change my attitudes and views	1	2	3	4	5	6	7
124.	Others tell me that I rarely speak about how I feel	1	2	3	4	5	6	7
125.	On the whole, I'm satisfied with my close relationships	1	2	3	4	5	6	7
126.	I can identify an emotion from the moment it starts to develop in me	1	2	3	4	5	6	7

127.	On the whole, I like to put other people's interests above mine	1	2	3	4	5	6	7
128.	Most days, I feel great to be alive	1	2	3	4	5	6	7
129.	I tend to get a lot of pleasure just from doing something well	1	2	3	4	5	6	7
130.	It is very important to me to get along with all my close friends and family	1	2	3	4	5	6	7
131.	I frequently have happy thoughts	1	2	3	4	5	6	7
132.	I have many fierce arguments with those close to me	1	2	3	4	5	6	7
133.	Expressing my emotions with words is not a problem for me	1	2	3	4	5	6	7
134.	I find it difficult to take pleasure in life	1	2	3	4	5	6	7
135.	I'm usually able to influence other people	1	2	3	4	5	6	7
136.	When I'm under pressure, I tend to lose my cool	1	2	3	4	5	6	7
137.	I usually find it difficult to change my behaviour	1	2	3	4	5	6	7
138.	Others look up to me	1	2	3	4	5	6	7
139.	Others tell me that I get stressed very easily	1	2	3	4	5	6	7
140.	I'm usually able to find ways to control my emotions when I want to	1	2	3	4	5	6	7
141.	I believe that I would make a good salesperson	1	2	3	4	5	6	7
142.	I lose interest in what I do quite easily	1	2	3	4	5	6	7
143.	On the whole, I'm a creature of habit	1	2	3	4	5	6	7
144.	I would normally defend my opinions even if it meant arguing with important people	1	2	3	4	5	6	7
145.	I would describe myself as a flexible person	1	2	3	4	5	6	7
146.	Generally, I need a lot of incentives in order to do my best	1	2	3	4	5	6	7
147.	Even when I'm arguing with someone, I'm usually able to take their perspective	1	2	3	4	5	6	7
148.	On the whole, I'm able to deal with stress	1	2	3	4	5	6	7
149.	I try to avoid people who may stress me out	1	2	3	4	5	6	7
150.	I often indulge without considering all the consequences	1	2	3	4	5	6	7
151.	I tend to "back down" even if I know I'm right	1	2	3	4	5	6	7
152.	I find it difficult to take control of situations at work	1	2	3	4	5	6	7
153.	Some of my responses on this questionnaire are not 100% honest	1	2	3	4	5	6	7